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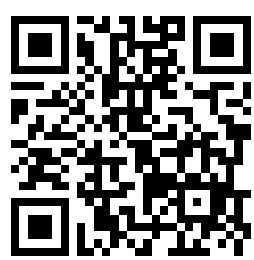

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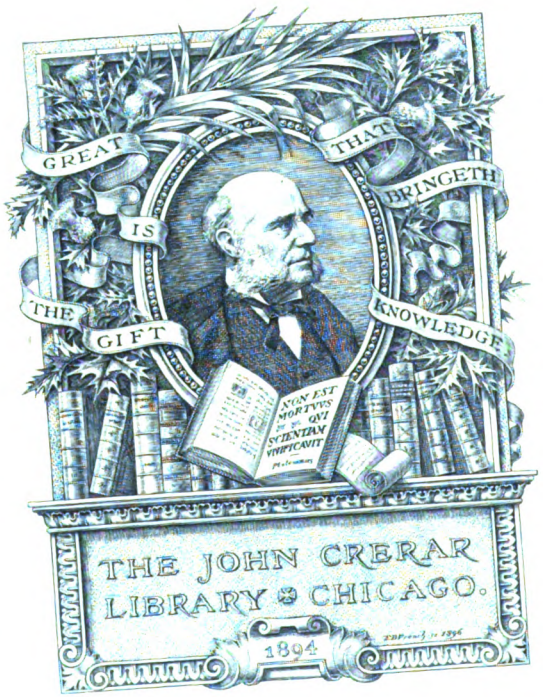
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The Process Engraver's Monthly

("The Process Photogram")

FOUNDED BY
H. Snowden Ward, F.R.P.S.

VOLUME XVIII.
1911.

LONDON:
GEORGE ROUTLEDGE & SONS, LTD.
(DAWBARN & WARD, LTD.)
68/74 CARTER LANE, E.C.

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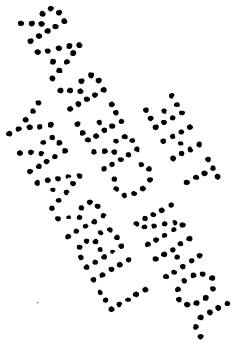

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INDEX.

	PAGE
About Amphitype: The Process Fully Explained	132, 152
About our Workers	264
A Curious Effect in Cinematograph Photography	332
A Dual Royle Exhibit	127
Advantages of Dry Flong, The	316
A few Useful Hints to Press Photographers and Process Engravers	234, 255
After the Holidays: A Straight Talk	247
A Huebner-Bleistein Patent: Is it a New Lease of Life for Litho?	213
A Look Round Columbia House	36
American Process Engravers at Work, The	292
A New Era for Colour Process: Colour Printing Revolutionised	318
A New Way of Working the Half-Tone Process	222
Anglo Engraving Co. Ltd. at Milford House	119
An Alleged Danger in Quartz Lamps	320
An Hour at Barnet: A Look Round Messrs. Swain's	4
An Hour at the King's Printing-House Foundry	95
A Note on the Huebner-Bleistein Process	107
An Orthochromatic Filter: Some Experiments	117
A Patent Challenge	225
A Process Review of 1911	309
Are Blockmakers the Legitimate Three-Colour Printers?	189
A Substitute for Transfer Paper	249
A Wonderful Variety Machine	49
Bad News for Printers' Devils	254
Baryta Propects for Photographers	245
Brevities 54, 84, 111, 138, 168, 195, 222, 277, 307, 329	
British Help called in by France	25
B.J. on the Costing Question	332
Camera in Italy, The	21
Can and Can't of Offset Printing	76
Care of Half-Tone Screens	328
Causes of some Difficulties in Colour Reproduction	294
Cavalier, A Supplement	*facing p.* 44
City and Guilds Examinations: Photo-Engraving Prize Winners	276
City and Guilds of London Institute	163
Collotype—The Negative	174
Colour Mixing	262
Coronation, The, and the Engraver	169
Correspondence	56
Costly Free Bevel, The	103
Cost of a Minimum Half-tone	62
Death of Mr J. Pulitzer	283
Does a Guaranteed Circulation Really Benefit the Advertiser?	303
Duplicating Houses, The, and their Latest Move	287
Educate the Customer	154
Electrotypers and Stereotypers, The: The Present Position of	311
Empire Press Exhibition, The	220
Facings and Pacings 41, 70, 104, 134, 161, 183, 207, 238, 260, 305	
Family Circle, The, of a Great Firm	226
Fine-Etching and Offset Printing	18
Flat-Bed Offset Machine	301
Flat Impression Principle, The, in Proving	22
Foreword, 1911	1
Glass Plate *versus* Glue Plate: Some Curious Ruminations	256
Government Contract for Process Blocks, The	77
Grave Copyright Considerations	113
Greens in Three-Colour Work	171
Half-tone Reproduction of Xmas Cards	17
Hawkins, Mr. A. G., on the Cold Matrix Process	300
Huebner-Bleistein Machine, The	237
Hints for the Technical and Commercial Photographer 177, 202	
Honorary Blockmaker, The	266
Hours and Wages of Electrotypers and Stereotypers	209
Hours Crisis, The: Is it an Opportunity for Raising Rates? 29, 57	
How Collotype Work should be Carried Through	231
How Process Workers might Protect their Sight	298
How Some Grey Borders are Made	225
Humidity as a Cure for Electricity in Paper	297
Hunters', Messrs., New Premises, Supplement	*facing p.* 148
Improvement in Lead Moulding	317
Index of Current Literature 79, 109, 137, 166, 193, 219, 250, 275, 306	
Ink-Knife Intaglio Rotary Machine	194
Intaglio and Litho in Combination	166
Intaglio and "Offset" Colours Combined	185
Inter Alia	263
Interdependence in Process: How Plates, Papers, and Pigments affect each other 91, 125	
Jubilee Edition of the *British Journal of Photography* Almanac	51
Lead Intensification of Half-Tone Negatives *versus* Copper and Silver	201
Lens Errors and their Effects on Process Negatives	32
Levy Ruled Screens	35

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INDEX.

	PAGE
March Events and some Suggestions	85
Messrs. Mann's Triumph at Turin	297
Mixture of Collodions	150
Modern Dark Room, The	106
More Offset Publicity	75
Mounting of Blocks, The: The Printer's View-Point	44
Mr. Frank Short, A.R.A.	31
Mr. Hamburger's Colour-Photographs	240
My Causerie 23, 52, 77, 110, 136, 165, 191, 218, 251, 274, 306, 327	
Need the Shadows Flee?	199
Newcastle Engraver, The, and the Insurance Bill	276
New Processes by L. Villemaire	153
No Conqueror believes in Chance	21
Offset Printer and the Process Man	58
Offset Printing Machine, The, and the Process Man	20
Optical Qualities of Colour Filters	73
Orthochromatic Filters	155
Our Interviews	267
Paper Stretching, the Result of some Experiments	87
Patents 25, 51, 80, 139	
Photo-Engraving in the Provinces 10, 74	
Photographic Original, The, in Half-Tone Work	60
Photogravure Printers make an Important Business Change	261
Piercing Troubles and the "Miller"	241
Plain Words on the Half-Tone Plate, by Mr. F. E. Ives	208
Polarisation of Light, The 156, 186	
Polychromide System, The, at the Dover Street Studios	291
Practical Hints on Copying	288
Preparing Negatives for Reproduction Work	128
Presidential and Ex-Presidential Greetings	15
Printing on Nickel	261
Process Engravers' Association, The Annual General Meeting	302
Process Plant Replanted: A Stroll through Messrs. Hunters' New Premises	131
Process Printing, from the Standpoint of a Letterpress Printer 12, 47	
Prospecting in Process: A New Intaglio Suggestion	142
Provision and Prevision: A Look Round the New Hunter Establishment	147
Publications 27, 53	
Pure Blacks and Whites through Work on Negatives	244
Recent Developments in Photo-mechanical Work	194
"Recognition" in a New Aspect	328
Reproduction of Pen Drawings	135
Restoring Engravings	217
Return of the Periodical Son, The: Some Interesting Intaglio Notes	315
Rotary Photogravure	35
Rotary Photogravure, Patent granted to Mr. Saalburg	81
"Rush" Work in a Daily Newspaper Office 2, 46	
Safe-edging Half-Tone Blocks: The Serviceableness of a Burr	192
School Notes 26, 53, 83, 112, 138, 193, 252, 277, 307, 329	
Some Autumn Happenings	253
Some Difficulties in Large Colour Works	227
Some Notes of the Month	141
Some Pointers worth Pondering	251
Study of Technical Photography, The: A Forward Movement	135
System in Screen-Negative Making 9, 72	
Talks With Our Friends: Dr. Mees 284, 322	
"Thebest" Paste Scores	19
The Evil of Too Much Money	320
There's a Good Block Coming, Boys	262
Three-Colour Effects from Two Printings	243
Tilley Camera, The	279
To Prevent Disputes, Order Clearly	239
To The Trade?	321
Tuck's First Decade	259
Value of Illustration, The	304
Value of the Silhouette	244
Wallpaper and Fabric Printing by the Mertens Intaglio Method	273
Wedding of Process and Litho, The	229
What is Restriction of Trade?	281
What is your Plant Costing You?	145
What it Costs to Make a Plate	102
What some Successful Men think of Illustration	242
When Instructions seem Impracticable: Some Ways Round Difficulties	190
Wisdom of Ordering in the Quiet Time	239
Working Process by Daylight 115, 146	
World in Colour, The: A Visit to the Photochrome Company's New Quarters	63
"Wratten" Works Description, The	313

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Estab. Jan. 1894.
"The Process Photogram."

THE PROCESS ENGRAVER'S MONTHLY

Vol. XVIII. No. 205.
JANUARY 1911.

Founded by H. SNOWDEN WARD, F.R.P.S., Founder of *The Photographic Monthly.*

Foreword.

1911, at your service, gentlemen. I am obliged to introduce myself, my introducer, 1910, having, I am sorry to say, passed away. He was a good fellow, taken all round. He had admirable business qualities. It is true that you never quite knew where you had him; he was apt to be chilly (in summer) and warm and hearty (in September); and another weakness of his was that he was much too fond of elections. However, he has gone; and I am here, gentlemen, to do all I can for you. And apparently there is a good deal to be done.

There is the matter of the relation of offset printing, and particularly of colour offset, to half-tone printing, to be thrashed out. There are improvements, in the mastery of such innovations as Paynetype, overdue. There is rotary photogravure to be carried through new developments. The virtual monopoly in this practice may be dead, gentlemen, before I am. There are improvements in double-tint printing to be made. Altogether, gentlemen, I think I shall be busy; that is to say, I think we shall be busy.

I have brought you a present, gentlemen. The intrinsic value of it is not great. But the essential value, you will be first to recognise, is enormous. Here it is, gentlemen—my New Year's card. Simply a Copy Book, with headline Maxims. "Take care of the pence and the pounds will take care of themselves." Almost as old as sunshine, and almost as useful. Turn the page—here's the Golden Rule. I suggest, gentlemen, very respectfully (for I don't forget my youth, and that you have received thirty or more guests like myself during your careers), I respectfully suggest that the Golden Rule is not only a sublime ethic, it is fundamental common sense. I mean, when one tries honestly to apply it.

I am sorry, gentlemen, for any man who professes a hankering after friendly understanding with fellow-craftsmen and whose practices look the other way. I am not so much angry with him as I am sorry for him. He is not happy. A double life is a dog's life.

Turn another page. "A time for everything, and everything in its time," says the Copy Book. And on another page is the counsel that Mr Gladstone gave to his son: "Keep your accounts, and the easiest way to keep them is to keep them carefully."

One more heading to copy, if you please: "Many a mickle maks a muckle."

* * * *

And with that ends the message of the New Year. 1910 claims to be not a child exactly, but a young man, and, we may add, a business-like young man. This value of the littles is particularly vital to bear in mind. It becomes a more urgent reminder as our business changes in its

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trends. Bearing on these "littles," let us say we have just visited an engraving establishment which has success written all over it. One reason is that a great amount of thinking, real brain stress, applied without the consciousness of labour, to each detail in turn, has evolved quite a number of time- and labour-saving contrivances, and even of error-preventing contrivances, such as we never saw in any other engraving establishment in the world, and we have closely studied a good many. They were shown to us in confidence, and we cannot particularise. "All the copy you will get out of me," said our cicerone jocularly, "is to say that I carefully put in a gas-engine which thuds exactly at the seconds! That is a bit of a convenience!!" His embargo is tantalising, perhaps. We should like to mention all the little applications, and very likely they will get round the trade. But it must not be through us, to whom their disclosure is confidential. All we wish to suggest is that there is no stage in the making of the process engraved plate, from the exposure to the last bit of mounting, in which brains could not, even to-day, be usefully brought to bear, to think out some method of improvement upon established usages. And it may be that occasional slack times can be usefully employed in making certain classifications, or markings, or in doing certain work which will save time during the rush when next it comes. Little things, but they make a muckle. We beg to underline that part of the greeting which the New Year gives.

And we would end with the good old Yorkshire toast, "Here's to us. All on us. May we ne'er want nowt. Noan on us. Nor me nowther."

"Rush" Work in a Daily Newspaper Office.

By Hannen Swaffer, Art Editor of the "Daily Mirror."

In these days when rotary presses are multiplying in so many hundreds of thousands a night the result of applying the half-tone process to photographs, it is perhaps interesting to look back on the earliest days in which the half-tones were used in daily newspapers.

It is said that Mr. William Randolph Hearst, the millionaire proprietor of so many American newspapers, was the first journalist who ever used half-tone blocks for reproduction by means of a rotary press. In those days he owned several big newspapers in America—in these days he owns even more—and, improving things as he always was, so far as newspaper production was concerned, he wanted to replace the line block by the more up-to-date half-tone. But in his office there were several very expert champions of the "can't-be-done" school of thought.

"No, you can't print half-tones on a rotary machine," they said. "First of all, you can't stereotype a half-tone block; and secondly, a rotary machine travels too fast." And thirdly, fourthly, fifthly, etc. So William Randolph Hearst thought of the captain of his steam-yacht—an Englishman named George Palmer, whose vigorous and burly methods of dealing with lazy sailors had often commended themselves to the newspaper proprietor's notice.

Whenever a sailor refused to work or tried to explain why something could not be done, George Palmer used to kick him, and the consequence was that his ship was soon the best manned and best

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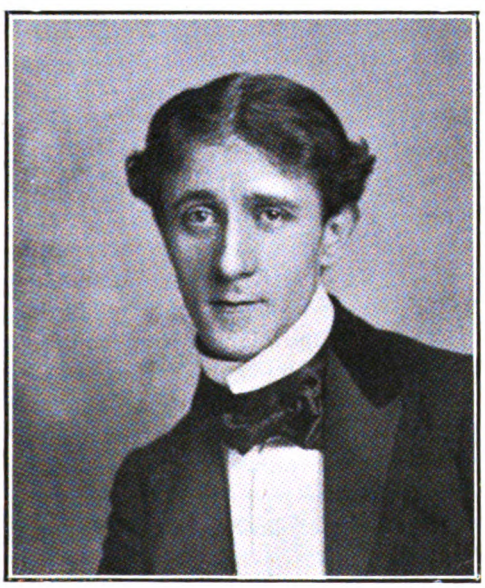
managed among the whole steam-yacht fleet belonging to the millionaires of New York and Pittsburg.

"Look here, George," said Mr. Hearst, "you take the next boat home, and go and print half-tones in the *New York Journal*."

"But say, boss, I've never been in a newspaper office in my life, and don't know what a half-tone is," said George Palmer.



MR. HANNEN SWAFFER, ART EDITOR OF THE "DAILY MIRROR."

"Never you mind. You go back to New York and tell the *Journal* people to print half-tones, and, if a man says it can't be done"—well, what was then to happen was something certainly unconventional.

When George Palmer took it on, all the experts came along the first day and talked the usual "can't-be-done" for exactly three seconds. Then George Palmer got to work. The "can't-be-done" experts limped lamely out of the room, and the following day the *New York Journal* came out with half-tone reproductions of photographs really well printed.

The idea then came to England, and, so far as one can trace, the first half-tone blocks appeared in 1892 in the *Daily Graphic*. Later, very successful half-tones were looking out from the pages of the *Daily Express*. Mr. Alexander Kenealy, who is now the editor of the *Daily Mirror*, and who in those days was the news editor of the *Daily Express*, suggested the idea of printing half-tones to Mr. C. A. Pearson, who was then the proprietor; and although he had to face the same old "can't-be-done" doctrines from some members of the staff, the result was an attempt and a success.

Things have got along since then, and we are breaking records every day.

It is claimed by the staff of the *Daily Mirror* that we have broken more records than anybody, so far as half-tone work goes. The *Daily Mirror* had to do it because of the obvious reason that there was no sense in getting the best, the latest photographs, and the most interesting photographs, without taking good care that they were printed as quickly as could be and in as many copies as possible. And, as rivals sprang up all around, the *Daily Mirror* had to become more enterprising even than it had been before, so along came the perfected idea of making blocks in the quickest possible time.

Not many weeks ago, the proprietor and the process manager of a big American paper were being shown round the *Daily Mirror* office, when they were introduced to Mr. E. R. Stewart, the process manager in the *Daily Mirror* staff. The proprietor introduced the process manager from America as "the man who had the record 'cut' in America"—they call half-tone blocks "cuts" in the United States—"and he made it in twenty minutes."

"Oh, our record here is nineteen minutes," said Mr. Stewart. The

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American thought Stewart was exaggerating. So he changed his story.

"Oh no, I remember now—we made a record cut in fourteen minutes," he said.

"Well, well, try another one," said Mr. Stewart, and there and then made for him a block in not many seconds more than eighteen minutes. That record is one which is now equalled almost every day in the *Daily Mirror* office.

When the Prince of Wales was confirmed at Windsor Castle, the negative of a photograph was delivered to our photographic department, undeveloped, at one minute past seven. At three minutes past eight the front page of the *Daily Mirror*, containing a whole-page reproduction 10¼ by 10 inches in size, was sent to the stereotypers. In one hour and two minutes the photograph had been developed and printed, the engravers had done all their share, the captions had been set by the compositors, and the page was made up and sent to the stereotypers.

Some few years ago, when rivals were becoming enterprising, the Grand National was raced for at Aintree, and the train by which the photograph was to be sent to London left Liverpool at ten minutes past four, arriving in London just about four hours later. As an edition had to be sent to press at twenty-five minutes past eight, the *Daily Mirror* made special arrangements that a photograph of the finish of the race should appear in every copy. The editor approached the railway company, suggesting that the *Daily Mirror* should be allowed to make a half-tone block on the train. But the "can't-be-done" school triumphed on this occasion; because it was pointed out that the light necessary for the making of a half-tone block could not be allowed on a train unless it were used in a gunpowder carriage, as it was a very inflammable thing; and the Board of Trade regulations said that a gunpowder carriage could not travel as part of an express train.

However, time was saved all round in the office: a front-page block was made in thirty-five minutes, which also is another record; and the photograph appeared in every copy of the following morning's paper.

(To be concluded.)

An Hour at Barnet.—A Look Round Messrs. Swain's.

THE magnificent premises which Messrs Swain have recently entered in Shoe Lane, off Fleet Street, the premises known as Columbia House, might well cause one to overlook the fact that, after all, the great hive of industry—a very busy hive—associated with the name, John Swain, is fixed at Barnet. And there would be the less ground for blaming anyone who did own to this forgetfulness, from the circumstance that at Barnet the great firm in no sense blazens the fact of its presence in the midst. It seems to shrink away. If I were a reckless sportsman I would wager a choice Havana to a Woodbine fag, that many a man, even many a business man, paying a rapid visitation to Barnet, has actually failed to find John Swain's at all; just as many a man in a hurry may have failed to find the old *Times* office in London in the days of fifty years ago, before the congeries of little byeways had been cleared, and

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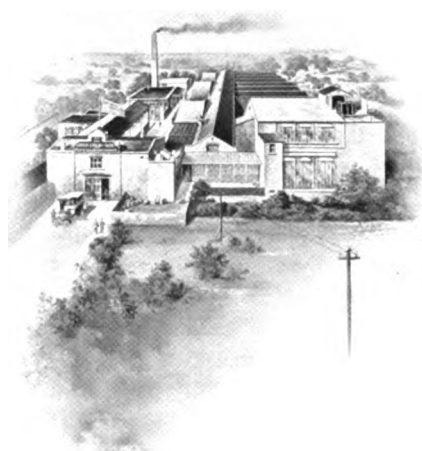
MR. W. HOLT, MANAGING DIRECTOR AT BARNET.

Queen Victoria Street had torn itself a broadway right through them. George Augustus Sala, in his *Twice Round the Clock*, written now long ago, makes great play of the twists and turns you take to reach Printing House Square.

Had he been visiting Barnet he would have noticed that John Swain's were not to the front at all—oddly as that sounds—not to the front at all in a geographical sense. No; you pass up the road from Whetstone and proceed some half-mile or more beyond the point where the road to New Barnet turns off to the right; and keeping straight on through the picturesque old town you come to various openings on the right, each leading to nowhere in particular, generally into some *cul-de-sac*. Finally you happen to note, if you have eyes and wits about you, that one of those short byeways on the right terminates at about a hundred yards distance in the broad front of a low building. Upon this front is the legend in Doulton ware, "John Swain & Sons, Ltd."

Passing the entrance gate of the inquiry office we meet the always courteous managing director of these Barnet works, Mr. Holt, and busy as he is, he becomes our cicerone. We enter the artists' room. A long row of these gifted votaries of the art are working in a north light—as good a light as this record rain and December gloominess will let them have. (The weather seems to be very disgusted about something or other. Surely it is not so grossly partisan as to be weeping for the fortnight on end over the elections.) All originals are carefully examined by the artists before they go out of the studios to see if there are any defects. And when I say that one of the etching machines alone has the greedy habit of etching many thousand square inches of



General View of the Barnet Works.

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A Studio Glimpse.

half-tone in a week, one can judge that the artists are kept busy like everybody else.

Honestly, I can't recommend Satan to call at Swain's at Barnet with jobs of mischief for idle hands. "It's no good, old chap," they'll tell him. "We're not sinners; we're engravers; far too busy to be worrying about pleasing you."

There are well over a dozen large half-tone cameras in this part of the works. A very large daylight studio—probably one of the largest, if not *the* very largest in England—is at the top of the building. But cameras are things which want a lot of space, and it is not very surprising that one even very large studio area cannot accommodate them all.

When in No. 1 half-tone room I noticed an arrangement at the rear of the dark rooms whereby plates could be passed through from the developing room into the sensitising room through slide covered communications. I might add that there is no possibility of direct light causing fog in the dark rooms. The sensitising room is a large one.

We are soon in one of the colour half-tone studios. There are three large cameras in this particular room. These have all the advantages of fine swinging stands, of easily moved traversing gear for the carriage of the lamps, and various equipments for special extension.

These cameras are all complete in the largest connotation of the term. There are various lenses to each. There are prisms in plenty, with silvered mirrors if preferred, for any job or by any operator. Certainly a camera without its screen adjustment gear is naturally not considered to be complete, and there are special gears for enlargement or reducing purposes. There are diaphragms galore. These comments apply broadly, be it understood, to the great collection of costly cameras installed by the house.

When a man has made a negative he sees no more of it. Off it goes by wire-controlled carriage to the printing room.

In the printing room we note one noble pneumatic frame. It is 49 × 40 inches. It was specially made for the firm. The printing is not all by electric light, although I imagine most of it has to be executed thus. There is a small platform outside the printing room whereon films can be placed for our good old sun, which I remember had a good shine upon us in 1893, to render his inexpensive aid. American and Australian engravers have

Row of Platens for Printing.

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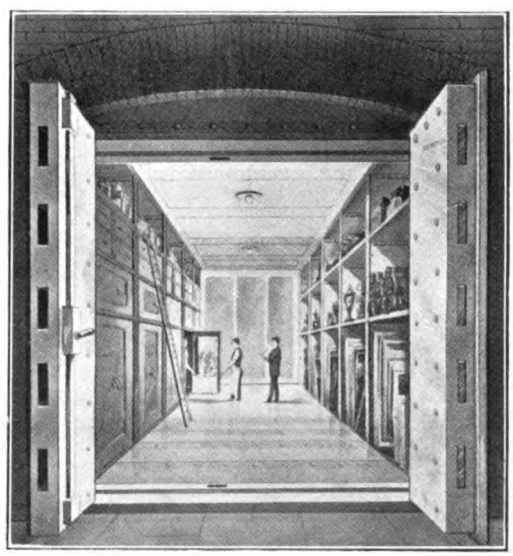
a great pull over us British folk. We have a climate and know it; they have a climate and don't know it. Some of them, particularly in the colonies, hardly need to print artificially at all.

Having glanced at the operations of developing and burning in, we have the opportunity of seeing how the coating and sensitising are carried on, and next the etching.

In the mounting room I note the micrometer gauge attached to a machine. With its aid the operator knows exactly what kind of borders—to speak of borders—he is making; he knows exactly what adjustment to make to duplicate that border. The type-high gauge machine here employed was perhaps somewhat unfamiliar in its shape. A thin tissue sheet placed upon the face of a mounted plate caused an indicating finger to move nearly a third of an inch along the brass arc of a registering index. A stouter but still thin sheet showed wider swing of the pointer. In a corner of this room stands a large compressor for fifteen or twenty Aerograph air-brushes. We pass on to a room in which the switchboard is erected encompassed with a stout wire net railing, permitting plenty of room for the engineer. The recording ammeter would interest any engraver or electrician. Its pen tells instantly and with great nicety what the variations of the light have been. You know exactly when you have the power on, and any waste or extravagance can be checked. Power is from the Companies' supply through two large mains to provide for one of them failing—460 volts for motors, reduced to 230 for lights. Motor meters are busy in their revolving work.

Two strong rooms appeal to one as very significant of the nature and scope of the business. One is full of fine pictures, tapestries, and other articles of great value. It is a very spacious room as strong rooms go, but for all that is probably crowded at times. Another room is that in which screens and lenses are stored. Here, at any time after work, there will be lenses and screens which have cost the firm some thousands of pounds. Such a little in cubic measurement, it seems, to represent such outlay.



Strong Room for Pictures.

We pass upstairs to a colour-etching room. Here scores of plates are to-day being touched up. Whatever low-priced work may be keeping anyone busy, Swains certainly get their share of the better priced. About twenty artists are here at work. I noticed some handsome carpets and objects of grace and rich colouring, to which the eye of the artist could continually make reference if he desired.

So to the top studio, where I note a camera taking 32 × 25 plate. All cameras here are large and finely equipped. The

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dark rooms have fan ventilation and automatic arrangements for ventilating now one dark room and now another, corresponding to the function of dampers in the domestic stove. A monstrous silver bath is one item noted *en passant*. Collodion emulsion is a favourite agent at Barnet. One takes stock, looking around, of a large camera draped in black for transparency work.

Strong Room for Screens and Lenses.

Our cicerone chances to put his hand as we pass upon a fine Watson lens 28½ inches covering a plate about 36 inches. There is nothing in the casual incident in itself, since fine lenses are very numerous here, but somehow I am struck with the obvious pride—I was going to write the tenderness—of the master engraver for his silent, subtle, and almost human-seeming servant, with its wonderful eye. It was so obvious that the world was ransacked for the best, and the best when found was delighted in.

Resting for a moment in the studio, a question is raised as to the contrariness which prompts the customer with the dangerous little knowledge to order a very fine screen from some feeling that if he is getting 200 or more lines to the inch he is surely getting more for his money than if the screen employed is 150 lines.

Our guide is emphatic upon this point, speaking from plenitude of practical experience.

"When you take a photograph from a photograph, there is almost inevitably a somewhat mealy appearance. The finer the screen you have the more this tends to show up." He added: "What has to be remembered is that the finer the screen you use the closer you have to work to your plate." He illustrated his meaning by the simple expedient of holding his extended finger away from and then near to the wall, moving it to show the different shadow effects in the bright light of the workroom. "You have to work on shadows, you know." All the varieties of screens mean so many varieties of shadows in the actual working.

The fewness of the fine-etchers was a revelation. Mr. Holt is obviously a believer that the ordinary rightly made negative, and the well printed, well etched, and well mounted plate, should be able to dispense with the work of the fine-etcher. That is the best Austrian tradition, and he concurs in its soundness. No doubt it is a counsel of perfection at the moment. The question is how near can we get to it. And the answer is that here we can get very near indeed.

Next month I hope to tell something of a visit to Columbia House, Messrs. Swain's works in London. Q.

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System in Screen Negative Making.

By Sigma.

As technical knowledge progresses so operations become more and more systematised, and errors of working gradually become reduced to a negligible minimum. In screen negative work there are so many variables that the great majority of workers have no well-developed plan on which they make their negatives. Their skill rests entirely on long practice, experience in trial and error. Still, here and there one meets some who have made the attempt to eliminate a few of these variables.

In the making of a screen negative many factors contribute to the final result. Of these we may mention the lighting, its intensity and character, the variation of exposure with reduction, the kind of original to be reproduced, the size and shape of the stop, the camera extension, the fineness of the screen, and the screen distance.

Now, of these, the last four can certainly be controlled. The lighting in this country is usually the arc, which is fairly constant. The variation of exposure with reduction, while it rarely presents any difficulty, is scarcely to be dismissed with formulæ usually given, because in process work there is usually an original that is too large to assume that the light falls off from it inversely as the square of the distance, and too small to be considered as an indefinite plane from which there is no diminution as one recedes from it.

The kind of original is certainly the most difficult factor to allow for, and it is here that experience counts and is of very real value.

In some photo-engraving houses the originals undergo a preliminary sorting according to their reductions, so that all those requiring the same position of the camera can be dealt with together. For rapid and accurate setting of the camera to any given reduction it requires a scale along the stand which gives the position of the camera carriage for every reduction, and a second scale for the camera extension. These scales may be graduated by focussing two marks exactly 10 inches apart to the same size, to 9 inches, to 8 inches, to $7\frac{1}{2}$ inches for $\frac{3}{4}$ size, and so on, down as far as the camera will reduce, and marking the positions of the camera on the stand.

The camera extension scale, which should be marked at the same time, is not so simple to construct. If the front of the camera is fixed, then the positions of the back for the various reductions may be noted. Usually the front moves too, and then one of the simplest devices is a spring tape measure stretched between the back and front. This may serve not merely to focus the camera for any given reduction, but also to indicate the real camera extension, which is of value for finding the size of the stop. It is not an easy matter to find the camera extension directly by measurement. One may approximate the position of the plate, but the position of the second equivalent point of the lens is not usually known, and if it were, the measurement would often have to be made from it to a mirror and then on from the mirror to the plate.

This difficulty may be overcome quite simply if the focal length is known. On most good lenses it is marked, otherwise

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it must be found. When a lens is arranged to copy same size, the camera extension is twice the focal length. While in this position the tape measure is fixed to the camera back with its catch fastened out of action and then the tape pulled out and fastened to the front part, so that the camera extension, twice the focal length, is indicated by the tape against some mark on the back. Then as the camera extension is altered for various reductions, so the tape runs in and out and indicates its various values. It is convenient to mark the reductions on this tape as they are marked on the stand. When this is done the camera may be set so that any original shall be sharply focussed at any given reduction.

With regard to the stops there are two methods that can be used. Either the size of the stop may be varied in proportion as the camera extension alters, or the screen distance may be varied in the same manner. The former is to be preferred, because then the ratio of the camera extension to the aperture is kept constant and the same character of dot formation obtained at all reductions. If it be decided to use this method, then any predetermined ratio of camera extension to stop can be obtained by measurement of the actual sizes of the stops, but it must be remembered that the effective size of a stop is always greater than its actual size, because of the magnifying effect of the front components of the lens, and allowance must be made for that.

For example, if it were decided to work at a real ratio of *f*/45 this could be obtained setting the camera to copy same size and putting in the stop marked *f*/22, for then the camera extension is equal to twice the focal length. If the actual size of the *f*/22 stop is then measured, other stops may be made whose diameters bear the same relation to the diameter of this stop as the various camera extensions do to twice the focal length. These stops may then be marked with the corresponding reductions. In this manner the proper sizes of stops are secured without the necessity of measuring the effective aperture of any of them. If the lens has an iris diaphragm this may be graduated in reductions by this method.

(*To be concluded.*)

Photo-Engraving in the Provinces.

By Harold Hood, F.R.P.S.

A Tribute to Customers' Loyalty.

My photo-engraving experiences began in the extreme corner of north-east Yorkshire, in the autumn of 1889.

In a photo-engraving sense that might casually be regarded as almost at the very birth-time of modern "process," but it really wasn't. For even the first-class weeklies, the *Graphic* and *Illustrated London News*, had risked their reputations early in the seventies on line blocks by the zinc-etching process, and, finding the result more than passable, had made regular and continually increasing use of "process," though they did not take seriously to half-tone till almost the end of the eighties.

It was six years before '89 that I saw my first half-tone. This was a frontis-

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piece to the *Year Book of Photography* (published in 1883), by the process of that remarkable printer-engraver F. E. Ives of Philadelphia. I saw it in a friend's house before I had dreamt of taking up photography at all. It was, too, in the house of this same friend (Mr J. E. Stead, F.R.S.) that, five years later, I was urged

MR. HAROLD HOOD, F.R.P.S.

and encouraged very materially by him to take up photo-engraving as a business.

These little matters I mention as bearing on the question of photo-engraving in an obscure corner of the provinces. At that time—although I personally could not dream of posing as a pioneer—there was a strong flavour of novelty about "process," and a stronger idea that there was "money in it." After persisting in line photo-zinco for two or three years we soon found that though there might be money in it, it *stayed in*—even at fivepence per square inch for line.

At the beginning of 1893 I took up half-tone work in real earnest, and we were advised, by the old expert who gave us "finishing lessons" in half-tone, not to attempt to obtain general work from London or other publishing centres. He gave us to understand that competition was so keen that we should do better to work up the new field of the north-eastern district. This in spite of the fact that the square-inch rate of that period was 1s. 3d. to 1s. 6d. per square inch for ordinary half-tone!

Middlesborough's predominant "publishing," and that of the Cleveland district of which it is the capital, is, however, mainly that of "pigs"—of the "G.M.B." iron type—and it had few manufactures of a sort that could use up much illustration. Consequently, we in a year or so found we had either to give up engraving or seek a larger field than Middlesborough. We chose the latter.

Now, in all honesty, I aver that it is only to an enemy I should be tempted to say, "Become a provincial photo-engraver in whatever town you may be."

I should say that the essential factor of success to a provincial engraver is—location in a publishing centre surrounded by an unusually large number of printers within his district; or, perhaps it might answer as well if the district was one having a number of factories turning out large quantities of manufactured goods of an artistic nature, or household furnishings or requisites in large demand, in which there was constant change of design. Absence of these conditions means a greatly increased cost in that most essential of all photo-engraving departments—the department of order-getting.

I can quite well remember what we then (from '93 to '97) considered the cruelty of our earlier working conditions in half-

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tone, but which I now recognise to be the natural consequences of starting a photo-engraving business in a centre perfectly unsuitable for the particular class of trade we aimed at.

The enthusiastic forecast of our friend —that we should have more than we could comfortably handle locally—proved absurdly far from true. Since, therefore, the work would not come to us, we went after the work. But it was all very, very slow and discouraging. To have established in London, or Birmingham, or Leeds, or Glasgow, or any other similarly big city, would have meant a great deal bigger turnover relatively to the cost of advertising and travelling.

In those earlier days a big staff was out of the question. Occasionally we sadly needed it, when the big orders *did* come our way, but the average turnover did not warrant it. And there you touch on one of the chief disabilities of provincialism in our line. Of course, when these big orders came along, it nearly always meant excessive overtime, and not merely double shift but "all-shift," sometimes for two or three days and nights at a stretch, rather than fail in delivery to time. This did not conduce to the health of the writer, or his loyal chief operator of those—thank Heaven!—past days.

I may be mistaken, but, if my own observation goes for anything, it seems to show that, speaking in a broad sense, there seems to be more permanence among the customers of photo-engravers than among the customers of other branches of the graphic arts—that is, more loyalty of a given customer to one particular engraving house over a term of years. If this be true, it should mean that literal "goodwill" is not altogether a figure of imagination. This very difficulty which photo-engravers generally must have experienced in turn—that of getting customers away from other houses in their earlier years —proves, after one has reached discreet years of long establishment, to be one of the most consoling things in business life.

Of course, it should be hardly necessary to add that one must do something to earn that loyalty.

(To be concluded.)

Process Printing.

From the Standpoint of a Letterpress Printer.
By J. R. Riddell.

SOME VALUABLE HINTS.

HALF-TONE printing in black and colour is greatly in advance of what it was a few years ago. The demands made for greater excellence, and appreciation of the difficulties to be overcome to ensure the best results, have been responded to, but there is still room for greater improvement. It is only by working hand in hand that this can be achieved. It is not within the scope of this short article to criticise the engraver's work, but he should certainly see that the printer is supplied with plates that are "printable" under commercial conditions. But it cannot be denied that the printer often lays the blame of a faulty reproduction on the engraver when he himself is at fault.

Let us consider some of the printer's difficulties. His standard is usually the engraver's proof, which ought to be pulled fairly on the machine (our correspondent evidently is not in favour of hand-press

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proofs.— Ed.), with no double or triple rolling, nor faking of colour to get a passable proof. Of course, it is assumed that the plates are clearly and deeply etched, and in a good working condition, mounted on a base that is true and of the required height. But it is seldom these conditions are attained. How often do we find that a plate of high technical

MR. J. R. RIDDELL.
(Messrs. Thos. Forman & Sons, Nottingham.)

excellence is mounted upon a base totally unfit for its duties, and thus prejudicing the engraver's work at the commencement? It is pleasing to note that some of our leading firms now recognise that the base on which they fix their plates must receive attention, and it is to their credit to say that they consider the base must not only be true to height, but should also be square and accurate to pica measurement, thus assisting the compositors in "making up."

Few employers seem to realise how much the cost of production is increased by a faulty, yielding base, which necessitates many stoppages for patching up during the run. All wood bases have an affinity for moisture, and, no matter how good the wood may be, the fact remains that it is unsatisfactory through contraction and expansion due to changnig atmospheric conditions.

The printer has to face a real difficulty when he is required to print many different subjects on one sheet, and it is here where the engraver and printer should "get together." The engraver has probably proved these subjects singly, with the result that one will carry more colour than another; and it is under these circumstances that the impracticability of proving in toned colours is apparent, and gives the printer an opening for saying some unkind things about his co-worker the engraver.

Now, if the engraver would recognise these difficulties, and endeavour to get the colour *in the plates* and not obtain it by overcharging a printing plate with ink (which means poor, "muddy," "dirty" results), he would certainly earn the colour-printer's gratitude. Also let him work according to the fundamental principles of the three-colour process—that there are three colours which are known and accepted as the correct shade —and not depart from them (unless, under special circumstances, instructed to do so). If this was done, we should hear less of the variation and unsatisfactory results obtained by the three-colour process.

The printer's responsibilities are many if he is to do justice to the engraver's workmanship; no detail, however small, must be ignored if he is to be a successful colour-printer.

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TEMPERATURE.

One thing in particular ought to receive attention, and that is the temperature of the machine-room. Much of the success in turning out work satisfactorily lies here. Experience has taught that men, machines, paper, and ink work in harmony, and the best results obtain at a temperature of 65° to 70°. This ought to be a uniform temperature over week-ends and holidays.

PAPER.

In printing process colour-work unusual care must be taken with the paper, so that exposure to air may not affect it. Coated paper has a composition surface which easily takes up moisture, and damp air coming in contact with it is sufficient to cause a sheet to stretch and become "wavy" along the edges. A sheet in this condition is useless for delicate register work, therefore it is necessary for the printer to give attention to the maturing of the paper before putting it through the machine. There are various ways of "seasoning" paper—by hanging up or laying out in trays in the machine-room some days before printing, but even this may not ensure success in close register work, if care is not taken to keep the sheets well covered up during printing. The object the printer should have in view is to keep the sheets well covered before, during, and after printing; piling the sheets, keeping the edges square and even, and the pile well covered up so that no air can get at the edges.

It is well, also, to remember that a perfectly flat sheet is necessary to obtain good register, a sheet with "wavy edges" being useless. A good paper, from a printer's point of view, should be pure white, have evenness and regularity of surface and thickness, good reflection of white light, and a soft and sensitive coating with no liability to "peeling." And it would reduce the printer's troubles if the paper-maker could produce a paper that would not stretch or contract.

MACHINES.

It is necessary that the machines be of modern make, built for the purpose of process-printing; they should be rigid under pressure, with accurate registering adjustments and ample rolling power. Great improvements have been made during the last few years in endeavouring to get a machine that will meet all the exacting requirements of the process-printer, but such a machine has yet to be put on the market. We have machines, however, capable of giving first-class work so long as the demands come within their limitation, but there must be still greater improvements, particularly in pressure and rolling power, to enable us to comply with the demands for larger and heavier colour process-work.

It is the printer's duty to see that the most is made of the machine under his control, and too great attention cannot be given to the adjustments if he is to turn out good process-printing. For instance, nothing plays a greater part in register work than the position of the sheet and the adjustment of the grippers, which should be set evenly, and tightened so that each gripper has a grip of equal tension, or not less than a half-inch gripper margin. Care must be taken regarding the edge of the sheet coming into contact with the curve of the grippers.

A "lift" of paper being thrown down heavily on the feed-board is liable to affect the registering, and also a feeder leaning on the edge of the feed-board may create difficulties in the same way.

(To be continued)

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Presidential and Ex-Presidential Greetings.

A GOOD BADGE AND GOOD BADGERING.

The Free Illustrators. We invited Mr. Arthur Cox (of the firm of Arthur Cox, Ltd., of Birmingham), and Mr. Carl Hentschel, City Councillor (Carl Hentschel, Ltd., of Fleet Street, E.C. and Norwood), to send each a New Year's greeting to the trade, as respectively the President and last ex-President of the Process Engravers' Association. Mr. Arthur Cox writes:—

"I have been asked by the new editor to write a New Year's message to the trade. Of course I take it he means the process trade. It is an easy thing to ask, but a somewhat difficult thing to do.

"The most seasonable message I can send is, of course, a hearty wish to all for a right prosperous New Year; and may you all have as much work as you want and a bit more profit than you expect.

"Even if these ideals of mine came to pass, there would, I am afraid, be many bitterly disappointed, not because they had obtained all the work they wanted, but because they had made profit, there being so many in this noble, self-sacrificing business of process engraving who would loathe the idea that working for profit was in any way connected with their daily labours. Even as I write, I imagine that I hear their voices being raised against me and my mercenary wish.

"So what am I to say as a message that will please all? Would it be out of place to give an open invitation to all to come and join the Process Engravers' Association? Even as to that, I fancy I meet with dissension, on the ground of a fear that such an Association may attempt a scheme for raising selling prices. I can, however, assure any suffering such misgiving that their fears are ungrounded. If they did join us and it was their wish that no such scheme should be attempted, such a wish would be duly recognised and respected.

"My good friends and competitors, when I think of our true position, I am sure you also realise and agree with me that we are traders who have cause to be proud of ourselves, particularly at this period of political crisis in Great Britain.

"We without doubt afford one of the finest examples demonstrating to our arguing politicians how our trade is absolutely unaffected by foreign competition! And protected! not by import duties, but protected far better, by natural means—to wit, by distance and water—yet we do not attempt any unreasonable selling price of our products. Neither do we unanimously form ourselves into an association for furtherance of any movement in the interests of our own worthy selves.

"If only the Tariff Reform League realised what a valuable living example we are, they would be offering large sums to hire us as exhibits for proving to unbelievers that Englishmen would not raise the prices of their products even if tariff duties were to be so high that all foreign competition would be cut out.

"Gentlemen, the noble race of process engravers have realised that mankind, if it is to be happy, must have pictures. Their lives must be brightened by illustrations in every shape and form. Accordingly, we, as producers of these pictures, have set ourselves the task of supplying that most dire need. We run establishments which we call businesses, and run them for the

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pleasure of feeling that we are supplying a national need, and doing this for the mere pleasure of doing it. We do it simply because we like to work and feel at the end of the day that we have done some good by giving pleasure to others.

"Gentlemen, I think there is an explanation why our Association is not unanimously supported. It is wrongly named; and there is no doubt that is why many members of our noble profession have not joined us.

"We should have called ourselves the 'Free Illustrators.' Just look what a success the 'Free Masons' movement has been! It's the title that's wrong; there is no doubt about it. The matter must have immediate attention. We really must come out before the world in our true colours and emblazon forth our new title 'Free Illustrators,' and be recognised as the public benefactors that we are. A Royal Charter may even be granted us.

"Having adopted such a title, we could meet together, all of us, in one large social gathering absolutely united and happy. Together we could work out schemes for still further reducing price. Who knows but that we might devise some cheaper means of living, or possibly might discover a drug or combination of developers which, if taken, would overcome any desire for sleep. By the aid of such discoveries we might be enabled to live more cheaply and work incessantly, and so further reduce our selling prices.

"Having struck this brilliant idea, I feel that it has fallen to my lot to solve a great problem. It now only remains for others to express their desire for the furtherance of the movement. The Editor, I am sure, will gladly find space in his valuable journal for further expressions of opinion. I should just like, however, to suggest an appropriate design for an emblem for our new venture, the 'Free Illustrators,' and submit the same herewith for approval or otherwise.

"Perhaps the electrotypers would like to join our new scheme, for I am sure we

Mr. ARTHUR COX (of Birmingham) gives the trade his Best "Swishes" for the New Year; and suggests a business emblem.

all recognise them as another band of noble philanthropic workers.

"Trusting the foregoing suggestions and remarks will be received in a proper spirit and be given the support they are deserving of, I send them with compliments of the season to all.—ARTHUR COX."

Mr. Carl Hentschel writes:—"You ask me for a short New Year's message to the craft. I only wish I could indite some original and seasonable message that would assist the trade to rise to higher things. Carlyle says: 'There are forty million people in this kingdom—mostly fools.' Were he alive now he would say that fools are chiefly found in the process trade. Anyhow, we are all in the same category. We seem to be a suspicious, unbusinesslike, narrow-minded, take-what-we-can-get sort of crew, fit only for one trade, *i.e.* our own.

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"Instead of co-operating to secure the benefits which should accrue to ourselves, we slave away for the benefit of our customers, who bluff us in the most ingenuous and delightful manner, playing one against the other to their heart's content. We are only too eager to give way to any suggestions which will enable us to hold our work, especially when it is so easy; when it only means reducing the price. Directly we are told that Messrs. X. Y. Z. are already supplying half-tone blocks for some absurd rate, how we simply jump with our offer to do them at 25 per cent. less!

"What a happy land it is to live in! Anyway, the end cannot be far off. Prices are nearing a vanishing point, and then think of the heavenly bliss: we shall have the extreme honour of working for our customers for nothing. Can a more delightful state exist?

"But are we to drift to that condition, or are we going to stiffen our backs? 1910 is passing away, an unsatisfactory year, no doubt, to many. What are we going to do with 1911? Surely we can wake up and do something? The question is, What is to be done? If it were any other trade, the answer would be quite simple.

"Why not adopt business methods and fair prices? Don't allow ourselves to be dictated to by our clients as to what they should pay, irrespective of profit (this word is becoming and has almost become obsolete in the process trade). Buck up for the sake of the trade, if not for yourself. Have a little more confidence in your competitors. Honest and fair competition is a healthy thing, but the unbusinesslike methods and tactics adopted in the process trade are enough to damn anything. Let us co-operate and work hand in hand, or at least in friendly business rivalry; study our cost; study our business methods; study our clients by all means, but not at the expense of our existence; and if we possess any common sense, let us see if we cannot assimilate a little of it in our trade. Common sense might advance our business prosperity. Let us try and study it for the New Year. We say the same thing at the commencement of each year. Let us mean it this time.

"Here, then, are good luck and good wishes to all, especially to the trade which has kept us--somehow—all these years, and which, with some united action on our part, we may perhaps place in the forefront, its rightful position, among trades in general.—CARL HENTSCHEL."

HALF-TONE REPRODUCTIONS of Xmas cards, selected or perhaps originated by various royalties, are one feature of *Hearth and Homes*, shilling Xmas number, which will specially appeal to our readers. Messrs. Tuck seem to have handled the business of them all, or almost all, and we are not sure about the Kaisers. The Kaiser chose a spirited sea subject, King Charles about to embark on the "Royal Charles" at Scheveling in Holland, to proceed to England at the Restoration. King George's card presented King Henry the Eighth visiting Cardinal Wolsey at Hampton Court. Queen Mary's shows Flora Macdonald taking leave of Prince Charlie. The Queen of Spain's is a happy notion—"The marriage of King Edward of England with Eleanora of Castille in 1245." Queen Alexandra's card depicts the landing of King Canute on the Dorset coast in 1015. The Queen of Italy chose a subject of universal appeal, a reproduction of a lovely painting by H. H. Bennett, "The Madonna and Child." The whole issue is attractive, and will be interesting to posterity as illustration of days when the female form divine lost its hips. We tremble to think of what the inevitable reaction may bring. There is a photogravure supplement.

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Fine-Etching and Offset Printing.

ARE WE TO GET AWAY FROM THE FINE-ETCHER?

By "Delta."

"INHERENT" AND "INCIDENTAL" FAULTS—DIRECT PRINTING—INKS FOR COLOUR INFERIOR TO PLATES AND FILTERS.

ALTHOUGH offset machines for printing three impressions in one passage through the machine were built some little time back, few three-colour prints appear to have been produced in this way. Most of the machines in use have been well occupied with black and white work.

The matter brings to the fore an old difficulty regarding the application of three-colour methods to lithographic printing, namely, that fine-etching cannot be done as conveniently on the lithographic stone or on the lithographic metal plate as it is on the half-tone block. This being so, it is of the more importance to produce three-colour results as accurately as possible, since to prevent is pre-eminently better than cure where there can practically be no cure at all!

In ordinary practice one is inclined to rely perhaps a little too much on the fine-etcher. Not only are those errors which at present are inherent in the process as now carried out rectified by that worthy man, but all those incidental errors which creep in at various stages it is also his little privilege to put right. This condition of things, this possibility that all may be put right in the last stage of the process, has its peculiar dangers.

We remember a certain Vice-Chancellor of one of the old Courts off Chancery Lane. Irreverent barristers were wont to represent him as constantly saying to the leading counsel in his court, "Well, well; if we're wrong, the Court of Appeal can set us right."

"Well, well," the plate-maker is apt to say, "if we're wrong, the fine-etcher can set us right."

That complacent comfort does not make for good technical work, and the errors due to the two causes — the inherent and the incidental—are not always distinguished. It is, however, possible by careful work to reduce the fine-etching to a small amount, and in many cases where a facsimile result is not necessary it is even possible to dispense with it entirely. In such cases the screen negative might be printed directly on the litho-zinc, for which purpose the negative would be made more "contrasted" than is usual. Otherwise, if the usual method of fine-etching is to be employed, the transfers must be pulled from the blocks when finished and then laid down on the zinc. The former method is, however, the simpler, and, despite the fact that fine-etching is looked upon as a necessity among most workers, there is the possibility that much work might be done without it. But before this could be thought of, quite the best conditions possible as regards the colour rendering would have to be fulfilled and the sources of error carefully considered.

It is not always realised that in three-colour work it is now the inks that are the chief sources of trouble. The advances that have been made during the last five years in filters and in colour sensitising make it practically possible to fulfil the

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best conditions as far as these are known for the record of the coloured lights, but although the inks have greatly improved latterly, they are still far from being as perfect as the plate and filters. This is a quite serious matter. Knowing the properties of even the best inks and the fine-etching unavoidable for facsimile reproduction, one is apt to forget the properties of ideal inks. These when printed full strength in pairs should give the primary colours, *i.e.* the red (or magenta) and yellow inks should produce a pure red, the red and blue inks should produce a blue-violet, and the yellow and blue inks a green, or bright green. No inks which do not at least approximate to these conditions should be considered for the purpose.

This test is perhaps somewhat severe, still it is the real one. Few inks will give a good blue-violet; it is more often a dark purple. The green, too, is sure to be dark, but the red may be good. However, as but few of the colours commonly occurring require two inks in full strength, this darkening of certain colours in reproduction does not show so markedly in the general run of work as in the tests. The three inks together should of course produce a good black.

Offset printing has the immense advantage that the smooth and surfaced papers now employed may be replaced by more permanent rag papers of any desired surface, and it is probable that the next few years will see some considerable development in the application of three-colour methods to it. There is little doubt, however, that success will only be secured by careful attention to the colour problems involved.

"Thebest" Paste Scores.

MESSRS. HUNTERS, LIMITED, of Poppin's Court, E.C., are naturally pleased with certain triumphant successes lately achieved by their paste known as "Thebest." It is supplied in two qualities. There may be various differentiations, but at any rate it is noticeable that the layer of this enamel-like paste is thinner where the work is of what may be called "news" quality. This "news quality" is intended for news work and general jobbing. It is not fair to call upon it for the very finest half-tone. For that work the other quality is needed, and it will be seen that here the deposit is thick, and the letters or ornaments, or whatever the impressing units may be, do not get through the paste on to the matt surface of the flong. From which it will be understood that the surface of the flong thus prepared has a fine smooth polish almost like dull, thin ivory. It is springy too. Certainly it is tough and strong. It is understood that one flong so prepared will yield twenty to forty duplicates satisfactorily. When possible the flong after coating should be put away for a day or two; perhaps even a little longer delay would be helpful. We would advise printers to make their own test as to this; we have heard a fortnight's delay recommended in like cases. It is due to the makers to say, however, that if necessary coated flongs can be used immediately. The coated flong should be placed in a damping book. It is useful, to note further, that flongs coated in this way show far less than ordinary contraction.

By the way, a printer recently tried "Thebest" paste with a large forme of very small type, which type had gone so often to the foundry that it had become battered. He thought he must be at the expense of re-setting it. No doubt he used a good coating; but the point is that he surprised himself with the clearness of the impression, and he was saved all the resetting cost. The depth and sharpness of the letters was to him most surprising.

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The Offset Printing Machine and the Process Man.

By Robert Vincent.

In this article Mr. Vincent, working head of the great engraving establishment of the Amalgamated Press in London (the Harmsworth proprietary) gives us the benefit of an observation he made in America, and of his own carefully-reached conclusions as to what offset means to the engraver and what it is "up to" the engraver to learn to do in this connection.

THE advent of the offset printing machine is exceptionally interesting to two important workers in illustrative art, the lithographer and the photo-engraver. For here we have a competitor in illustrating medium, and a competitor likely to score.

The tie between these two great litho and engraving crafts has not been nearly so close as it should have been. Only here and there do we find a man who has the principles of both at his finger-ends. The blockmaker generally confines his attention to the requirements of the letter-press printer. The lithographer is making very little use of the engraver except for screen negatives for use in photo-lithography.

Now the offset machine bids fair to become a link on the practical side between the two kindred crafts. And it behoves the craftsmen of each to come to an understanding both of the advantages to be gained by each, from the new power, and also of the limitations of the processes of each.

The lithographer taking up the offset printing machine can immediately put it to use in the same manner and on the same class of work as he is used to preparing for the lithographic printing machine. But if this is all, it is seriously limiting its use; and the photo-engraver who has had a lithographic training also is struck with the huge possibilities of advancement in economical art printing that the offset machine is to bring about. Further, he sees that his help will be needed by the lithographer to a boundless extent if the printer is to reap the full benefit of the machine.

Now all this means that the photo-engraver must have an understanding knowledge of what is required by the other craftsman; and likewise he must be ready with a persuasive argument to back up some very good points that he may be able to give him from his own experience. The danger is that each may think the other knows nothing of any but just his own special business. The lithographer in particular imagines he can get no enlightenment from the photo-engraver.

After all, the processes that have to be used are well known enough, but it is their application to the new conditions that makes them seem abnormal. For instance, when in Chicago I saw an offset machine being worked for a six-colour job, the transfers having been taken from two hundred screen half-tone blocks. This machine was installed in a photo-engraving department in a large printery, and was working very successfully in the hands of the process man, after both the letter-press machineman and the lithographic machineman had pronounced against the utility of the machine. On the other hand, on this side of the water I saw a

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machine working very well indeed on ordinary lithographic work, but the machine minder was rather diffident about attempting to put up a job that included transfers from some open screen blocks of 120 lines to the inch. This was simply because he had not seen work of that description put up on the machine, except by the direct photo-lithographic process.

One of the chief things that the photo-engraver must learn is as to the various methods of transferring and retransferring. The type founder is awakening to the fact that his type is the wrong way round for convenient use for offset printing purposes, and many of them are putting on the market founts that have their faces cut as you read print and not the reverse way. But the photo-engraver must be prepared, until such time as such type is common, to be able to transfer from paper to paper, and then down on to zinc in a cleanly and workmanlike manner. He must get to know the values of all the lithographic transfer papers on the market and the application of new ones—the "Norwich Film," for instance. He must see that he gets a negative for direct transferring that has complete details in it, so as to eliminate the work of the fine-etcher whom he is so used to depend upon for his finished result. He must be prepared to supply intaglio plates on copper for such printers as prefer their illustrated work from copper plates and albumen plates on zinc of the most finished nature, ready to be transferred on to the zinc for printing from. It will be his business to a very great extent to prove to the offset machine printer that through his skilfulness in transferring and retransferring, the machine will be able to reprint and imitate practically any known form of printed work, whether from relief blocks or intaglio plates.

THE CAMERA IN ITALY.—Arrangements for the representation of the British photographic industries at the Turin International Exhibition are advancing towards completion, and those who are fortunate etough to secure space will have one of the finest positions not only in the British Section but in the whole Exhibition. The sub-committee which was elected at a meeting of the trade in July last consists of Mr. H. W. Hall (Wellington & Ward), Mr. C. Houghton (Houghtons, Ltd.), and Mr. H. W. Smith (Platinotype Company), with Mr. Child Bayley (member of the Liberal Arts Committee) as chairman. Among the prominent firms which, up to the present, have decided to be represented at Turin are the Autotype Company, Burroughs Wellcome & Co., Houghtons, Ltd., Illingworth & Co., Platinotype Company, and Wellington & Ward. In Italy British photographic apparatus and materials are much in use. There are great possibilites for increasing trade in this respect.

"NO CONQUEROR BELIEVES IN CHANCE" is a phrase we meet in turning the pages of *T.P.'s Magazine* for Xmas, and the word may be commended to any doleful workers in our craft. The half-tones in this issue come commended in a kind of photo brown ink. That on page 348, "Les Platineurs," is quite wonderful in its triumph. It is only 2 by 3 inches, but the work is "all there," although it is crowded with figures. The chief features for us in this publication are an article upon "A Master of Illustration," Mr. Edmund J. Sullivan, whom the *Graphic* and *Daily Graphic* discovered, and Mr. Charles R. Gibson's article "A New Era of Science," in which there are helpful notes regarding electricity. The Sheffield meeting of the British Association in 1910, we read, will probably be remembered as that at which the first announcement was made of isolating the positive electron. "Negative electricity, we have for some time known, is made of separate particles, just as matter is made of individual atoms."

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"The Flat Impression Principle in Proving."

A MISTAKE AS TO WHAT ENGRAVERS DO.

MESSRS. PAUL SHNIEDEWEND and Co., the makers of the Reliance presses, have issued the following to printers:—

"Regarding proof-presses, have you ever considered these facts:—

"That the flat impression principle of the hand-press has lived through all the centuries of printing; that the very finest productions of all periods have been and are being produced by this style of press?

"That many attempts have been made to substitute a more or less differing principle for the taking of printers' proofs, engravers' proofs, and other classes of work calling for a limited number of copies?

"That these attempts have met with but one result—the discarding of the substitutes after trial (often accompanied by loss of the investment), and the rehabilitation of the reliable flat impression press?

"That engravers can and do produce the fine proofs of their engravings on flat impression presses; *and that they do not, because they cannot, use any other method?* (Underlining ours.—ED.)

"That the above holds true with the great class of the better printers, who realise that good proofs mean as much to them as to the engravers?

"That printers are often 'hard up' and many times fail in reproducing the quality and delicacy of these same engravers' proofs on the best types of cylinder presses?

"Is it not sufficiently conclusive that the press—the only style of press—that has been found adequate to this very finest of proofing also does it with the least amount of 'fuss'? Does it quicker, cheaper, more consistently than the short-lived devices whose standard of possible quality is many grades lower, or adapted to only the inferior class of work?"

Now I take no exception to the general argument by Messrs. Shniedewend in regard to the superiority of the hand press for certain proofing, that direct downward pull is the stroke par excellence for securing the greatest power and intensity. Besides, the artist-printer—and a very great many printers are artists, even in these difficult days—and when all is said and done, the artist-printer can do a great many things with the hand press which are not manageable in any other way. He can apply colour with unequal intensity in different portions of the plate. He can 'bring up' this and that with the maximum facility for the purpose. Still I have a quarrel with this statement, for it absolutely misstates the practice of at any rate the larger engravers. Though the fact is not known to Messrs. Shniedewend, a fact it is that it is not the usage of leading engravers to send in their proofs pulled upon a flat press. They know very well that it would not be reasonable to expect the customer to equal such proofs upon his platen during the run. As business men they realise very fully that they would only be looking for trouble if they were continually to send out to their customers proofs which it was not in the reasonable competence of those customers to equal. What they do therefore is to instal platens or other cylinder presses and proof their work upon these, and then they have the satisfaction of knowing that their proofs are made

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under "printing conditions." I have visited many engraving establishments, walking over every portion and minutely observing their practice, and I wish to vindicate the larger engravers from a reproach which seems to me to be, however unintentionally, conveyed in this paragraph. The reader is referred for an instance to the view appearing elsewhere in this column of the battery of platens used for proofing by Messrs. Swain at Barnet. Q.

My Causerie.

I HAVE just had put into my hands a copy of the *Belfast Weekly Telegraph*, issued under the famous Baird proprietary. The point I want to make in this connection is that the extreme clearness and force of the illustrations are due to the use of a high-class ink. I am not in the precise secrets, and if I were it would not be decent to disclose them, but I know I am substantially right in affirming that an ink is used very much superior to what newspaper owners will ordinarily put up with, or rather will make their readers put up with. You can mix so-called machine oil with your lampblack to make ink; and if the machine oil is poor enough, which in truth it generally manages to be, you can produce a vile compound which is able to make some sort of smear upon the paper where the illustration should appear or the types should stand out, and incidentally is just able to give you the very finest variety in headaches from overstrained eyes.

The Baird ambition is that every purchaser of the *Belfast Telegraph* should be able to read it. This sounds quite a paltry commonplace, but it would really mark an epoch if it were an ambition shared by every producer of a journal. The greyness with which we are daily insulted is becoming worse and worse. I believe the particular Belfast ink in this case is Morris & Bolton's brand. That is not to say that the other ink-makers would not supply the very finest newspaper ink, if only customers would pay for it. When A. B. Fleming & Co., the famous ink-makers of Edinburgh, were delighted with orders from the *Melbourne Argus* and *The Times* in their first year of trading, now about fifty years ago, they were paid 1s. 6d. a pound less the discount, for their supplies—at any rate that was their ordinary rate for inks of that quality; though there may have been some special concession to those great journals.

Mr. Frank Lloyd, of Edward Lloyd Ltd., owners of the *Daily Chronicle* and *Lloyd's News*, and incidentally owners of the finest papermills at Sittingbourne, declared a few years ago in an interview published in one of Carl Hentschel's advertising journals, "The British newspaper man is not handicapped" (in regard to paper, he meant. The interviewer had been querying as to whether the American newspaper man's paper has so much cotton stuff in it that it gave him a great advantage over British newspaper men in appearance). Mr. Lloyd said, "No; he is not handicapped. Let him pay ⅛th of a penny more per pound, and we will give him a super-calendered newspaper with a fine skin on it which will do justice to any really good plates."

If a stout sheet with a good super-calendered surface or skin is wanted, there ought really to be a little more substance put into the paper before it is thus calendered.

"Would the ⅛th of a penny suffice for the extra substance?" he was asked, and answered; "Hardly, but ¼d. extra would be quite ample even for those who wanted a very stiff, strong, as well as a beautifully-surfaced paper." They are the exact figures of the interview, but, to be sure, the interview took place a year or two ago. The essential trouble, however, and the essential remedy for the trouble, are the same, be the variations in price what they may.

Well, the *Process Year Book* is out, and as usual Mr. Wm. Gamble gives a very suggestive review of the whole plate-making position. To cite one philosophising, he thinks the business tendency is for the smaller engraving houses to be merged into the larger.

That is apparently the tendency in all businesses; it was never likely that ours would be an exception. Under-bid and under-bid, and one day the absurdity of it is bound to flash upon men; whereupon they see their profit lying in quite another direction.

There may seem to be something dreadfully sinister in all this, but the tendency is not in itself necessarily lamentable. And if it is inevitable, our wisdom is not to declaim against it but to understand it. After all, it is not a dreadful thing that twice three should be six. It is no use arguing that on every ground of common decency and public interest twice three ought to be five. Arithmetic is a dispassionate thing, and industrial trends have a dispassionate way of trending on, whatever we may think of them. The philosopher

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looks to see what good can be exacted from the trends, accepting them where they cannot well be resisted.

Take, for instance, the question of the larger colour work. There are only two or three firms in London who are fully qualified at any moment to handle the very largest three-colour half-tone in great quantity. That being so, it is surely the height of folly that any considerable amount of such work should be done at prices which rob those firms of such profits as would suffice for fair interest on capital and for renewal funds, and at the same time would allow them to observe trade union conditions at all points.

There is no need to talk of entire exchange of confidence between these houses, but there is a great difference between entire confidence and no communication at all. How to prevent loss through impossible prices ought not in such a case to "pass the wit of man."

To look again at the *Year Book*, the current issue impresses yet once more the great debt we are all under to the enterprising firm who years ago set a lead to the engraving and art printing crafts of two hemispheres by issuing this annual. Our readers know how the American *Graphic Arts Year Book* has come along at long last to serve its own nation in a similar way. We are not saying anything in depreciation of that fine if somewhat belated achievement. But there are no friends like the old friends. Well, here we are again. To speak of a few features of the illustration. The frontispiece is a Rembrandt intaglio. There is an unusual grain running through it. It is a good piece of printing. We pass to reproductions from Lippman work—always interesting, though sometimes suggesting that the fine-etcher has had a lot to do. The modus is by use of a translucent film with use of the mercury mirror, a coloured picture being seen by reflected light. A Reliefograph portrait study claims attention; it looks like an ordinary half-tone. An offset print done on a Waite & Saville machine is very interesting. It has a suggestion of collotype. There are plenty of examples of half-tone on good rag paper suitably calendered, but without the enamel coating. That dreadful precipitate barium sulphate, which makes our common half-tone stock—what a blessing it would be to get away from it more often, quite apart from the likelihood of paper thus coated being ruined in fifty years!

"Daffodils" is a half-tone with two tints, and very effective. A very suitable subject. There are a lot of double tint specimens in this issue. It is quite a revival of the two printing methods. The idea of two printings is to give a nice tone and body not obtainable with one printing. The effect is both stronger and softer than otherwise could be secured. Arthur Cox is well represented, and once, at any rate, it is by Schultz's screen work.

Carl Hentschel, Limited, show a good printing study. The Strand Engraving Company have a very nice three-colour. Some offset work shown in the volume should be examined in the light of notes appearing elsewhere in the article upon offset in relation to process. Hood & Co. of Middlesborough are represented by a landscape subject. They have known how to treat the sky, but to call them sky-scrapers might be a bit too tall. Mr. Payne's "Paynetype" is illustrated. When the craft has had a little more experience of Paynetype it will perhaps be as much used, and as successfully, for half-tone as it is for line. We have a number of studies illustrated by two printings with rather coarse screen, and yet with good effect. Contributions from the studios of some daily illustrated papers should be noticed. At page 158 there is a typical mezzograph picture, "The Fusiliers Returning from Church." There is, perhaps, a tone or two lost in the whites. It is hardly so good as similar subjects contributed by the *Daily Mirror* staff. In all there are ninety-six full-page one-colour plates, nineteen full-page two-colour plates, fifteen full-page three-colour plates, five full-page, with sixty illustrated articles. I hope to revert to this note-yielding volume. Meantime, a word in your ear—buy it.

I notice that Mr. J. A. Farrar, writing from 1 Wetherby Terrace, Burley, to the *Daily News*, calls attention to the inadequate encouragement, as he considers it, which manufacturers are giving to art school students, He asks: "How many employers or manufacturers go to the yearly exhibitions of students' work, either provincial or London? What an encouragement it would be to the student and to the art masters if manufacturers would walk around such exhibitions and pick out the most suitable designs, works, etc., required, give suggestions, offer a commission, an apprenticeship or position to the student, irrespective of whatever calling he might be following at the time! I know of young men aspiring for something better who have studied in the art schools, doing good work, who are cotton operatives, weavers, joiners, painters, etc., working at the mill, etc., from 6 a.m. to 5.30 p.m., afterwards going to the art schools because they loved the work they were doing. They would have filled any position had opportunity occurred. No opportunity came. Result, hopelessness. To them art schools are an absolute failure." F. COLEBROOK.

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British Help called in by France.

WHOEVER may think poorly of British newspaper illustration, French newspapermen do not. The latest proof of this has been furnished in connection with the new Paris illustrated daily paper, *Excelsior*. Its promoters no doubt knew that *L'Illustration* (Paris), when it needed some helpful guidance in the practical work of providing the right duplicates for its printers, sent over to London for assistance. In that case it was Mr. J. S. Sutherland, the head of the process engraving and foundry department of the George Newnes concern at Floral Street, Covent Garden, who was brought on to the scene in Paris, and with good result. The *Excelsior* rehearsals were not going well, so resort was made, once again, to London. The inquiry as to the right place to go to, for the special object in view, was not a perplexing one. *Excelsior* is issued from the office whence *Le Petit Journal* has for so long sent forth its widely circulated sheet. The great dailies of different lands watch each other, and a visit was paid to the office of the *Daily Chronicle*.

As a result, Mr Chadwell, head of the *Chronicle* foundry, went to Paris, taking an assistant, and took entire charge of *Excelsior* for four days. The paper was not then issued to the public, but the rehearsals were continuous and thorough. In two days a most remarkable success had been obtained; the owners and the engineers and all concerned were delighted. Certainly *Excelsior* as now appearing daily—a sort of enlarged *Daily Mirror*—with the aid in its foundry of the assistant whom Mr Chadwell took over and left in Paris, would do credit to any newspaper office in the world.

The Englishmen were certainly very pleased to find that good originals were being produced and were mounted on solid metal, and that the foundry plant was a really perfect equipment. They introduced two improvements which had excellent results. They secured make-ready in the original blocks. This is done in Messrs. Edward Lloyd's office in London, either by Dr. Albert's make-ready or by other under- or inter-laying. The flong is also thinned at the back, where the shadows of the subject occur, by a method of great simplicity and effectiveness which Mr Chadwell devised. The flong then is thin, and it is springy, and I may add that a broken flong is practically unknown at Edward Lloyd's. The second improvement was in the use of Williams' Stereoline enamel. The flong thus prepared is distinctly undulating to the finger, and probably surprised the Frenchmen.

Patents.

28,657, 1910. FURNIVAL, FURNIVAL & FURNIVAL OF REDDISH. IMPROVEMENTS IN ROTARY PRINTING MACHINES.

Relates to that class of rotary printing machine constructed with two or more cylinders in which the impression or sheet-carrying cylinder makes two revolutions to one impression.

The cylinders are constructed and arranged in the ordinary way, the impression cylinder to carry the sheet to be printed, and the printing cylinder to carry the printing plate.

27,665, 1909. W. H. PALMER, 52 STEPHEN'S ROAD, TUNBRIDGE WELLS. SCREEN PLATES FOR HALF-TONE PROCESS PRINTING.

Relates to screen plates for use in making half-tone blocks for process work, the object being to avoid the expense and necessity of the separate and costly diamond-ruled screens as now used, and also to lessen the time and labour and expense in making the metal printing plate from a second negative, the original picture now being photographed through the back of the plate, and thus through the screen sub-coating. The necessity of making a second negative from a printed picture from the first negative is thus avoided. The picture being taken reversed upon the negative plate, is therefore ready for printing upon the metal plate in its correct position for its final printing upon paper.

28,344, 1909. WAITE & WAITE, SAVILLE ROAD. MEANS FOR DRIVING THE INKING MECHANISM OF ROTARY LITHOGRAPHIC PRINTING MACHINES.

In a rotary lithographic printing machine, driving the entire inking mechanism by spur gearing arranged on one of the side frames of the machine from a shaft in advance of the printing cylinder through intermediate change gearing, so as to rotate the various inking rollers at the desired speed and independently of the cylinder gears.

30,547, 1909. PENROSE & CO. AND BLOCH. TRANSFER APPARATUS FOR PRINTING PURPOSES AND THE LIKE.

Relates to improvements in the construction of apparatus whereby transfers are made from an original printing plate, or the like, on to a printing surface, so that the actual printing may take place from a multiplied number of the original picture.

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School Notes.

SOME BOLT COURT SCHOOL PRIZE WINNERS.—The following were some winners in the December examination of members of the Bolt Court L.C.C. Engraving School. Sketch Club: 1, Morris Goldstein; 2, A. B. Cope (Miss); 3, F. L. Mitchell. Life Class: 1, Rosenberg and Penwarden, bracketed equal. Costume Class: 1, Goldstein and Page, bracketed equal. Antique Class: A. Lapworth. Colour Class: A. Field. Summer Sketches: 1, J. W. Nicholson; 2, A. Field and H. C. Hammond.

A REFERENCE EXCHANGE.—Here is a paragraph of undoubted interest to our readers in the current report of the L.C.C. Engraving and Litho School. It has for side head the words: "Effect of the School upon Trade," and it sets forth: "The School has been fortunate in obtaining excellent teachers. The fact that the average quality of the work in the trade to-day is stated by good authorities to be quite up to the level of the best work ten years ago appears to be largely due to the fact that processes which were one secret have become widespread, and this largely through the teaching given in the school, so that the school has acted a sort of reference exchange for the trade."

L.C.C. SCHOOL OF ENGRAVING: Reports 1908-9 and 1909-10.—The handsome volume in which these reports are embodied is before us. The London School is of course a school of design, *inter alia*, and the admirable cover border (work of T. Caton, student) and the repeat pattern of the end papers (A. Colinsky's work) exemplify at the outset what it can accomplish in that department. There were in the first of these two years over six hundred students, nearly half entering for photo-engraving classes or photo-engraving lectures. Papermaking and stationery accounted for a good number. Litho figures were not so high as one would expect. The next year's figures were also good. Unemployed men may enter for daytime classes without payment of fees. Technical photography classes are now taken on Saturday afternoons as well as Wednesday evenings. The papermaking lectures were so successful that they had to be divided into two classes, elementary and advanced. The report announces the resignation of Mr. Rea, the Art Master, and the Council's appointment of Mr. Walter Bayes to succeed him. There is a very interesting note upon the history of the School. All the typographic illustrations have been printed on the school premises, and with the exception of one lithograph executed by Mr. Way, all the lithographs have also been printed at the School by the School lithographic printer, Mr. T. Johnson, assisted by Mr. Green. The letterpress blocks have been printed by Mr. B. A. Newton, the School letterpress printer. The etchings and the photogravures are by Messrs. J. J. Waddington, Ltd. The printers of the letterpress are the Chiswick Press. We should like to detail and criticise the plates in this issue, but that must wait.

FOREIGN AND BRITISH PLATEMAKING: PAST AND PRESENT.—It was in 1894 that the London County Council became tenants of the premises at Bolt Court which they decided to use for the school of engraving. That being remembered, explains and adds interest to a minute by the Council's then styled Technical Education Board. "It seems (1894) that in these trades"—photo-engraving is obviously referred to—"some of the processes are carried to a much higher perfection in Vienna, Paris, and Berlin than in London, and in those cases in which London firms have been successful in competing with foreign houses, many of the skilled workmen are foreigners." After fifteen years the principal of the School which the L.C.C. then decided to assist and afterwards took over, is able to state in his 1909-10 report: "The School has established a reputation on the Continent as well as in London; many firms now apply to the School for assistance, and students have gone to all parts of the globe, several of them into very good appointments." He also notifies that four medals have been awarded, one of them a gold medal from St. Louis.

THE ANNUAL SUPPER of the Bolt Court School, or, more properly, the London County School of Photo-Engraving and Lithography, was held this year in the Gray's Inn Larder, off Holborn, because there is not a room large enough to accommodate the students and guests in the temporary premises, as there was at the school in Bolt Court.

Sir George Frampton, R.A., was again in the chair, and among those supporting him were Mr. Nelson Dawson, Mr. Selwyn Image, Mr. Llellewyn, Mr. Cecil Rea, Mr. Walter Bayes, Mr. Shadrach Hicks, the Principal of the Shoreditch Technical Institute, Mr. Rich and Mr. Gaywood, representing the L.C.C. education

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department, Mr. J. A. Corey, Mr. W. Gamble, and Mr. C. T. Jacobi and Dr. Mees, representing the Advisory Committee of the School, and Mr. Frank Colebrook.

The speeches were all short, and conceived in the happiest vein; the loyal toasts were proposed by the chairman; a student, Mr. Becknall, proposed the health of the Principal and Staff, to which Mr. Newton responded, and the latter then proposed the health of the Guests, coupled with the name of Professor Selwyn Image. Professor Image, in reply, was very complimentary to the work of the school. From him this praise is something to be proud of. The prizes were then distributed by Mr Nelson Dawson, who in doing so reviewed the art work of the School, giving hearty commendation.

The students then made a presentation to their former art master, Mr. Cecil Rea, the orator being R. C. Peter, who delivered an admirably phrased little speech. The gift consisted of a hammered copper plaque with an enamel ornament in the centre, and a small address to which the students had appended their signatures. The latter was a most tasteful production, the wording being set in old face Caslon, printed on handmade paper, and most chastely mounted and framed. Mr. Cecil Rea then replied, being obviously much affected. He also produced another gift he had received from his colleagues, the teachers in the Art School, in the shape of a silver drinking flask. This was full, and was passed round as a loving cup. He then proposed the health of his successor, Mr Walter Bayes, who responded in an extremely witty speech. Interspersed with these ceremonies were songs by students and their friends, with some character sketches.

Conjuring by E. A. Salt, and instrumental music by F. Lamb and W. Philips, were capital features. A very merry evening was brought to a close by singing "Auld Lang Syne," after drinking heartily the health of the chairman, proposed by Dr. Mees. Sir George, in replying, well said that so long as the spirit of brotherhood prevailed, which was now so conspicuous, he had no fears for the future of the School. It was regretted, no doubt, by many, that the play which has come to be looked for as a hardy annual couldn't be provided; but there was not the usual convenience for such a performance. The School is journeying in the wilderness to a promised land in the shape of the fine premises which the L.C.C. are going to erect on the site of the old school. Like the Israelites, they may have to wander forty years in the wilderness if the L.C.C. maintain its present rate of speed. Happily, Dr. Garnett and Mr. Blair are known to be so appreciative of the work of the school that their influence is sure to be exerted in its favour; and we may therefore hope to see the L.C.C. plans advance from the "negative" to the "developing" stage; *i.e.* we hope soon to see the actual housebreakers at work at Bolt Court. In the new school the accustomed Christmas play will, no doubt, be revived. Meantime we were very glad to have had character sketches.

Publications.

STRONG line work is conspicuous in the *Science Siftings Annual*. Half-tone also is shown to particular advantage in its remarkable illustration of "Bubble blowing." A very good sixpenny worth, this *Annual*.

THE "AUCKLAND WEEKLY NEWS" issues a special Christmas (summer) number. A great feature of it is the very fine colour sheet, 22½ by 15½ inches, a "Picturesque Scene on the Wanganui near Pipiriki." The foliage is quite wonderful, and the water with its reflection is very well produced. There is another large colour supplement, a large bird of brilliant plumage, with wording in red characters with cream shading or surrounding. The many half-tones are of the usual excellence.

THE "CHRIST CHURCH PRESS" issues a large chromo-litho subject of the kind with which we were made so familiar twenty years ago by the *Illustrated London News* and *Graphic* in the days before three-colour half-tones were thought of. Its cover also is bright, with a fine reproduction of a bird, black and silver being the notes. Slight silver lettering, black outlined, looks well upon the brown sheet forming this cover, as do the dark green leaves and the rich chrome berries. This is not so gaudy a cover as that of the companion *Auckland Weekly News*, but it is one absolutely after our own heart—restrained, simple, strong, handsome. The half-tones are splendid throughout. Double-tone ink appears to be used in some of them.

"PEARS' ANNUAL" (6d.) presents chromo-litho on its covers with plenty of half-tone after the familiar type. Pears themselves make a great hit with the advertisement on the

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back page. The Cardinal of Rheims is at dinner with his attendants and the jackdaw; idyllic boys with long golden hair wait on him. "And a nice little boy bro't a nice cake of soap, Worthy of washing the hands of the Pope." The letterpress is in various coloured inks; we have green and brown-red on pages facing each other, with the large plates centring such pages printed in the body. Variety in the same page is sometimes provided in such numbers, but is a tremendous machining cost. There are large three-colour half tone pages illustrating the hunting song "John Peel."

"PEARSON'S MAGAZINE AND COLOUR PHOTOGRAPHY."—The shilling Christmas number of *Pearson's Magazine* has forty pages in colour. Eight of these appear under the title *Photography in Colours*. The art editor encourages the amateur to purchase moderately (at the rate, he says, of 3s. for four quarter-plates) and go in for colour photography. It will be cheap, he seems to think; for friends pester amateur photographers now to take lots of useless monochrome pictures, whereas they will leave the colour photographer to select his subjects himself. Lumière, Dufay, Thames, or Autochrome plates are alluded to, and various directions are given. The illustrations are mostly of garden subjects, but include a delightful portrait study, "The Letter." A country girl stands at the gate of a pleasant garden. There is a fine colour photograph of the rainbow, showing also the reflection or double bow. Five seconds' exposure was given.

THE progress of the colour printers' art from the earliest times to the present day has been set forth by Mr. R. M. Burch, whose fine volume, *Colour Printing and Colour Printers*, just published by Sir Isaac Pitman & Sons, should have a ready and extensive sale. It is copiously illustrated in colour and monochrome, and is an orderly and most illuminating narrative. The book is published at the modest figure, all things considered, of 12s. 6d.; in America such a work would be published at ten dollars or thereabouts. The episode dealing with Le Blon is perhaps the most arresting in the book. Le Blon, who, of course, had no photography to aid him, had, however, Newton's primary colour conclusions for a guide, and he was emphatic that with proper combinations of red, blue and yellow he could reproduce any tones. Mr. Burch tells the story of Le Blon's really amazing career in London, and there is a wonderful touch of modernity in the narrative as we read how he founded this or that trading company and what distinguished men he persuaded to support his enterprises.

This father of modern three colour copied many portraits so well that there are apparently a good many old "oil paintings" which are nothing but Le Blon's prints varnished over.

PROCESS WORK IN "EDER'S JAHRBUCH, 1910."—This annual is of more than usual interest to the photo-mechanical worker this year, as it contains authoritative summaries of the progress made to date in the two branches of work that at present have the most topical interest, namely, offset printing and rotary photogravure. The first subject is dealt with by Dr. Eder himself, who includes in his treatment some history of the ordinary rotary lithographic machine. The subject of rotary photogravure receives several references; the principal article, however, is by Dr. von Schrott, the chief engineer at the Vienna State Printing Office. He gives full details of the Mertens process, and his article is illustrated by diagrams of this machine, and also of the machine proposed by Valentin Zerreis and Georges. The figures asked for the licence to use the Mertens process for newspaper photogravure is stated to be £600 for one year, £1200 for three years, £1500 for five years, and £2500 until the patent runs out. This does not allow of the printing of anything but newspapers, since the rights in the same patents for the printing of ordinary supplements, etc., are the property of the Siegburg Company.

Among the supplements to the volume are printed examples of rotary photogravure by Löwy of Vienna, Bruckmann of Munich, the Deutschen Photogravure Company of Siegburg, and one of the newspaper prints of Mertens, so that an interesting comparison can be made. The remaining supplements are not numerous and of no particular interest, although some of the duplex half-tones are about as good as they could be. Among the other articles should be mentioned those of Professor Albert on collotype transfer processes and Professor A. W. Unger on combination printing (in which are detailed methods for registering photogravure with other kinds of printing, lithography, collotype, or half-tone). Husnik writes on the reproduction of Autochromes, Amstutz on the use of curves in half-tone work, and Zschokke on the difficulty of making large process lenses. There are, besides, the usual summaries of progress in every department, under its appropriate head. The reader of German will be well advised to procure the book, which he can do in London, from Williams & Norgate, price 8s.

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Estab. Jan. 1894.
"The Process Photogram."

THE PROCESS ENGRAVER'S MONTHLY

Vol. XVIII. No. 206.
FEBRUARY 1911.

AND ELECTROTYPER'S AND STEREOTYPER'S REVIEW

The Hours Crisis: Is it an Opportunity for Raising Process Rates?

The only thing certain about the 50- and 48-hours controversy is that nothing is certain. Consider the changes which less than a fortnight has witnessed.

Begin with January 10th. After seven hours' conference discussion in London, the masters offered a 52-hour week to the representatives of twenty-two federated unions. This would have reduced hours appreciably in a few towns, provided the masters had influence enough in those quarters to induce local firms to honour the Conference undertaking. The men's representatives bluntly declare that just where a 52-hour week would be a substantial improvement it would not be obtained, because the Masters' Federation is not there any sort of power; that indeed it is no more representative of the whole country than is the men's Federation. They add that that 52-hours concession would have given London workers five minutes a day. It was rejected out of hand. Frankly, we have no tears for it. It would have been of no service as an argument lever for the raising of prices by engravers, electrotypers, or stereotypers. And it would not have affected any absorption of unemployed workers such as the Co-operative Printing Association did effect when it introduced a 48-hour week.

On January 18th the London Society of Compositors held a delegate meeting at the Memorial Hall in London. Every firm's staff sent to a man the full numbers to which it was entitled, ten members being allowed to send one delegate. The result was absolutely unanimous, we are assured; none the less it was recognised that all were involved in a grim situation. For at the very first brush, or sign of a brush, with the masters, the provincial unions in the Federation had broken away.

> "Sir Richard was a worthy soul,
> In battle much delighting.
> He fled full soon, on the first of June,
> But he bade the rest keep fighting."

The Machine Managers' Association was another to fall away. It looked at one time as if the London compositors would have to go forward quite alone. This they were prepared to do; but the Warehousemen and Cutters' Union and the Operative Printers' Assistants have thrown in their lot with them.

January 18th, then, may be called the date of the break-up (for present 48-hour campaign purposes) of the men's Federation. January 20th may be called the

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date of the break-up of the Masters' Association. Of course glosses are applied. The 48-hours movement is not abandoned in the provinces; oh, dear, no! It is only "indefinitely postponed." The London Masters' Association is not broken up; oh, dear, no! It is simply the case that some members who print papers "have found it desirable" to make certain arrangements with their men, and have conceded the 50 hours. Neither presentment commends itself to us as a portrayal of the fact.

"Facts are chiels that winna ding,
And daurna be disputed."

The situation is changing with such breathless speed that by the time we go to press we may have to insert in our last page a note indicating some transformation at present hardly imagined. But casting our mind over the general and our particular field at the moment of writing, we arrive at one or two conclusions which we would present to the reader, and bespeak his careful thought thereon. We are certainly not bent upon dogmatising. The matter is too grave, too many-sided; the view-points too various for confident pronouncement on every point. At the same time we have pondered things carefully, and it is fitting and convenient that some statement of view should here be made. Our readers are most welcome to use our correspondence columns on this or any matter affecting their interests.

The movement was inevitable as soon as it was found that unemployment returns were increasing. It may be true that in our own particular associations—the Litho Artists' and Process Engravers' Union and the Electrotypers' and Stereotypers' Society—this phenomenon has been less conspicuous. They were, however, likely to manifest the same general tendency. The report of the Poor Law Commission has had for an outstanding feature the declaration that unemployment has to be reckoned with in the present ordering of industrial affairs, as not a temporary or sporadic but a permanent and settled feature of competitive industry. And unemployment never stands alone: it is accompanied by under-employment of some not wholly out of work, and by over-employment of some regularly in work. Though the L.S.C. is specifically unconnected with engraving, it has to be specially noted as apparently the most virile of the whole of the twenty-two unions who lately federated, who are not formally disbanded, and who may some day more effectively federate again, and who have included the trade unions representing our especial trades. The L.S.C. is worth studying, therefore, with exact observation. Such study reveals three or four salient facts. The L.S.C. has only £60,000 reserve funds, yet it paid last year £32,000 for the support of its unemployed, older or younger; *i.e.* over £10,000 for superannuation payments and about £21,000 as out-of-work pay for those who should be "doing their bit." That being so, it has gone into the strike fray risking its £60,000—risking, therefore, that part of it which is the superannuation security, but buttressed by the weekly levy which the whole Federation will make (for this levy arrangement is not affected by the provincial unions' defection), and buttressed further by the resolution of "news" compositors and operators remaining employed to levy themselves 10s. a week (where they receive as much as 50s. a week), all the time necessity for such sacrifice is deemed to remain. Men earning under 50s. will contribute 5s.

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So potent is the existence of a body of unemployed in one union; sometimes totalling 1500 out of a total membership of 12,000, and averaging about 700 through the year. The 1300 represent nearly 11 per cent. unemployed, so the figures of 4·4 for L.S.C. unemployed quoted at the Conference seem hardly adequate, although they were quoted by Mr. Whittaker, the Conference chairman and the masters' spokesman, to show that there had been no improvement since the Askwith award of 1901, when the figures for five years had averaged 2·8. His point was that the 1901 concession had not helped things. In any case it is futile to expect unions to settle down quietly to the depletion or the stagnation of their funds.

Something, therefore, has got to be done. And something has to be done sooner or later by all unions. For it is futile again to think that improvement in hours enjoyed by the most important unions will not very soon be sought by all.

Why not anticipate the inevitable; make an appreciable concession of hours and use it, as the legitimate argument lever it will be, to raise rates to the public, that "ultimate employer of us all"?

Our view is that with business-like action now we may put down sixpence and pick up a shilling. With unbusiness-like neglect to seize occasion by the hand we may soon have to put down sixpence and pick up nothing.

Almost all process workers have been for some time putting in fewer than 52 hours, although electrotypers have been putting in 54. If so, the problem should not be so exceedingly difficult.

Let the trade be brought together as if it had never been brought together before. Let the price question be raised as if it had never been raised before. Let "the wit of man" be exercised as if in our sphere it never had been exercised before. In the words of the copy-book whose homely wisdom we invoked in our January issue, let us "Try, try, try again."

In the sixties one of our great statesmen was decrying the attacks on the Northern States of America. "You may think," he said, "that the North will not succeed. Do not commit the crime of wishing it." You may think the effort to give an uplift to the whole craft must fail. Do not commit the fault of wishing it. Let us once more, and as never before, endeavour to raise the whole status and increase the whole rewards of our arduous and highly skilled and our now absolutely needed craft.

MR. FRANK SHORT, A.R.A., was elected an Academician engraver, and Mr. Mark Fisher and Mr. C. H. Shannon were elected Associates of the Royal Academy, at a general assembly of Academicians and Associates held on January 25th. As an etcher and engraver Mr. Short, who is fifty-three, has had a brilliant career. Beginning life as a civil engineer, he soon decided to leave mechanical draughtsmanship and adopt a "line" of his own. Apart from his remarkable mastery of the etching needle, his magnificent mezzotints of the late G. F. Watts' most famous pictures and his plates completing Turner's *Liber Studiorum* have shown (says the *Daily Express*) his extraordinary cleverness as a translator engraver. Mr. Short is President of the Royal Society of Painter-Etchers, and director of the etching and engraving school of the Royal College of Art. Mr. Mark Fisher was born in Boston, U.S.A., and is the son of English and Irish parents. He excels in landscape and animal painting. Mr. Charles H. Shannon is widely known for his skilful portraits of beautiful women. He thinks the present type of men's evening dress "almost perfect."

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Lens Errors and their Effects on Process Negatives.

By A. J. Bull, London County Council School of Photo-Engraving.

THE errors to which photographic lenses are subject do not affect the process worker in quite the same manner as they do other photographers. The conditions are different. Press photographers, for instance, require lenses which are as rapid as possible, while for architectural subjects a lens is necessary which is free from distortion and is possessed of a sufficiently wide angle. On the other hand, process operators rarely have need of a lens working at a large aperture, and comparatively small angles are usually used. For both line and half-tone the exposures are rarely made at a greater aperture than *f*/16, by far the greater majority being at less than *f*/32. The stop, in fact, is not determined by the qualities of the lens, but by the conditions requisite for obtaining the dot formation of a screen negative, or for keeping the fine parts of a line job clean. What is desirable is that the lens to be used for wet-plate work should have its ultra-violet image as perfect as possible, and that this image should coincide with the general visual image, while for three-colour work it is of the utmost importance that the three images should be of exactly the same size.

The aberrations affecting lenses may be classed as axial spherical aberration, coma or zonal aberration, radial astigmatism, distortion, and curvature of field. These have their variations with colour, some of which are important. In addition, accidental defects occur occasionally, such as astigmatism on the axis and want of coincidence of the axes of the components. The latter defect detracts from the definition obtainable with a given lens system. It may be detected by viewing a light by reflection in the lens, when all the images formed by its various surfaces should appear to be in line. Astigmatism on the axis is usually caused by the deformation of some of the glasses owing to the unequal pressure of a bad mounting. Defects of this kind, and the aberrations which impair the quality of the definition, however undesirable they may be, do not necessarily render a lens unfit for process work, when they are not great in amount, owing to the fact that small stops, and hence narrow cones of light, are the general order of things.

Spherical Aberration.

Axial spherical aberration is the defect that the different zones of a lens do not direct the rays coming from an object on the axis so that they all meet at another point on the axis. In a simple lens the light which passes through the outer zones is brought to a focus first, before the light passing through the more central zones, as is indicated in fig. 1. The defect is eliminated by an adjustment of the front and back curves of the lens. It was one of the first errors to be corrected, and it should be a quite negligible quantity in any photographic lens. Where it is present the image on the axis alters in definition as the lens is stopped down, and may even shift in position. This error, however, does not seem to be quite extinct, for in the elimination of some of the more complex defects in some modern lenses it

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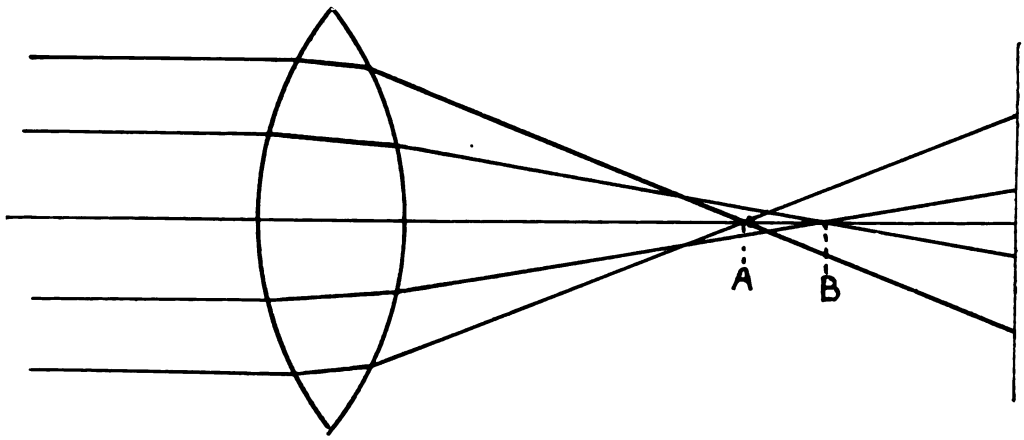

FIG. 1. Diagram showing axial spherical aberration. The marginal light comes to a focus at A, before the more central light is focussed at B. When the error is at all marked the focus of a point becomes a line on the axis.

seems to have crept in again slightly, while there are many lenses still doing duty in process shops which possess this aberration so markedly that they have to be stopped down for focussing.

CHROMATIC ABERRATION.

Chromatic errors in the position of the focus are most important in process work. The focussing is done with white light, and as the red and green constituents of this are the brightest, it is for these colours practically that the lens is focussed. On the other hand, at least three-quarters of the photographic effect on a wet-plate is produced by light which is invisible to the eye, the very faint cyanogen bands in the extreme violet accounting for the remainder. For the wet-plate image to be sharp these ultra-violet and violet foci must coincide with the focus of the brighter light. This is generally fairly well accomplished, but the importance of the matter lies in the fact that process lenses and prisms are now beginning to be constructed of glasses which have a high proportion of silica in their constitution in order to increase the ultra-violet transparency. The use of enclosed arc lamps, too, with their long arcs giving an abundance of ultra-violet and violet, tends to shorten exposures and to render the careful correction of chromatism very necessary.

OBLIQUE ERRORS.

More important than the axial errors are those affecting the light which passes obliquely through a lens, coma and radial astigmatism. Coma, or zonal aberration, is due to the various zones of the lens having different focal lengths, and hence forming images of slightly differing sizes on the axis. Its effects are much more marked in the marginal parts of the field, where it converts a point of light into a curious comet-like shape, hence the name coma. These shapes may sometimes be seen in photographs of night scenes, but in copying work the fault is expressed in a lack of sharpness at the edges of the plate. The effect is well seen in a simple lens, and the contortions which a marginal annulus of oblique light undergoes are seen in figs. 2 and 3.

As coma is an effect due to differences

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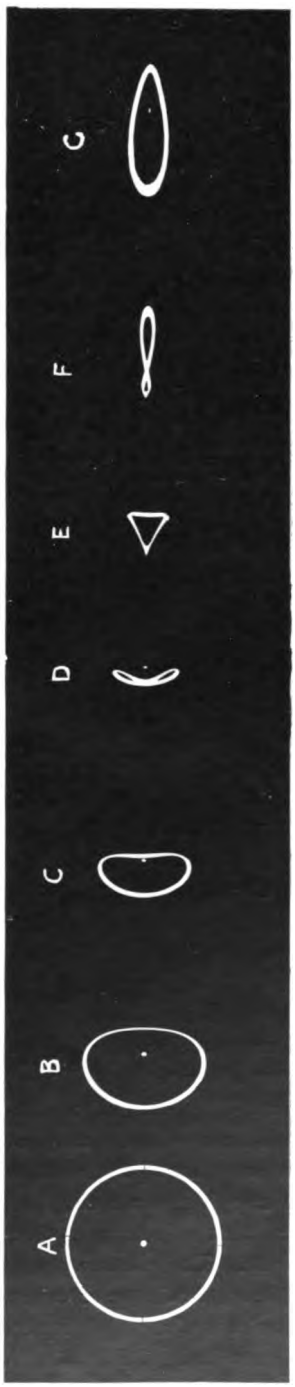

FIG. 2.

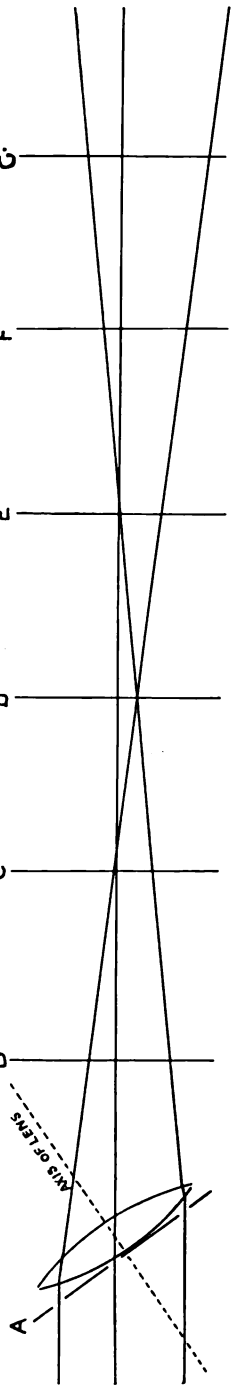

FIG. 3.

FIG. 2.—This figure shows the distortion of an oblique beam of marginal light due to coma. A is a stop placed over the lens which allows only a marginal ring and a central beam to pass. The subsequent photographs show the forms taken by the marginal zone of light in various planes behind the lens. At C the light from one side has already come to a focus and is about to cross the central beam, while the light from the opposite side comes to a focus at E. The focus of the light perpendicular to the paper is further on at F.

FIG. 3 indicates the path of the oblique beam of fig. 2, and shows the positions of the planes photographed.

FIG. 4.—Astigmatic cone of light passing through two focal lines.

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between the central and the marginal beams, it does not produce much effect at small apertures. The other oblique aberration, radial astigmatism, cannot be removed by stopping down. It consists in the light not coming to a point focus but first to a focal line tangential to the axis and then to a second focal line radial to the axis, the position of best definition being between these lines. The effect is shown on a marked scale in fig. 4, which is a series of sections of a pencil of light formed by an achromatic lens 25° from its axis. Both of these oblique errors can be seen in any lens of the rectilinear type, and they should be eliminated from any lens intended to produce good work over anything but a small angle.

Distortion: One Familiar Result.

Distortion consists of the relative sizes of the parts of the image changing from the centre outwards although the whole may be quite sharp. It is the defect which sometimes makes buildings in photographs appear to lean forwards. With most process work a little distortion in a lens does not matter. It must not amount to much, or squares and rectangles will be visibly out of truth, but occasionally work will arise which few lenses will do satisfactorily. This is the case when a scale of equal divisions has to be accurately reproduced. The difficulty of such a subject has been a matter of surprise to more than one photo-engraver.

Image Size Variations.

There is another chromatic error which is of the greatest importance to the process man, now that three-colour work has become so general, and that is any variation in size between the images formed by the whole of the visible light. The invisible ultra-violet does not count here, as it should not be recorded at all in three-colour negatives. This error may arise from chromatic differences in coma or in distortion as far as the lens is concerned, but the question is intimately bound up with the optical effects of colour filters. It is, however, of great importance, as it increases the difficulties of large-sized colour work. Small work is rarely affected by it.

Rotary Photogravure References.—We have various inquiries regarding photogravure. *The Process Engraver's Monthly* has always dealt in current issue with everything known relating to machine photogravure. Thus, taking up the volume containing the twelve monthly issues for 1910, there are numerous references, pages 38, 98, 101, 108, 121, 123, 290. For a concise summary of progress in the method, the article in Eder's *Jahrbuch* mentioned in the January number should be consulted.

One of the good features of the Levy Ruled Screens is the aluminium framing, which protects the edges of the screens from deterioration or damage due to soaking in the silver solution in the wet-plate process, or the separation of the glass by atmospheric influences, or chipping of the edges and corners through careless handling.

A patent was taken out by Mr. Levy for this idea on the ground of a novelty, in the frame being depressed below the surface—an important point when the screen is being used close up to the plate, as the thickness of the frame would otherwise make the screen distance greater than it should be.

The invention was duly patented in America, England, and France, but in Germany it has been the subject of a protracted and strong opposition. The application was severely contested and a very large amount of evidence adduced by the opposition, but the patent was nevertheless granted by the German Patent Office. One naturally supposes that all the evidence that could be produced before any court was brought to bear on the German Patent Office.

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A Look Round Columbia House.

1859 was a record-breaking sort of a year. It saw Gladstone break with the Conservative party, and become a Liberal. It saw Darwin break with tradition, issue his *Origin of Species*, and become a bogey. It saw the John Brown, whose "soul goes marching on," break with all the law and order of the United States, and become a warring guerilla. It saw John Swain the wood engraver break with the modesty which had kept him in the background and become a firm. For he then started the house of Swain.

To be sure, this young man had done much good work in his thirty years. John Leech of *Punch* had rejoiced in his skill and had stuck to him—like a leech. In particular, the great artist noticed that with no other wood-engraving interpreter could he give to the public maidens possessed of such perfectly drawn hands and feet. He put all his dear girls' feet and incidentally their whole presentment into John Swain's hands. And the engraver poured all he had to give at the feet of each of them. He was surely the faithfullest swain ever known—faithful to them all.

Years rolled by, and zinco process coming to the front some forty years ago, John Swain, now well established as a firm, took as an extra workshop a small studio in Farringdon Street, to be a home for this new child among the arts.

To-day that child, grown to prodigious size, has adopted its father, giving the father—giving wood engraving, that is to say—a comfortable corner on one of its many floors. The child, too, is housed now in a veritable palace. Columbia House is a noble edifice, nobly furnitured and garnished, base to roof. You pinch yourself when you enter. Is it a dream? That handsome carved doorway, those wide circling counters or desks and benches, all of American oak, that spacious and handsomely appointed waiting-room, that room for the travellers, and the more secluded rooms for the directing chief, Mr. Dargavel, and the secretary, Mr. Carpenter—they all seem the proper setting for some great bank. But process! What has prosperity to do with process? And see what a bad example, too, it is setting to younger engravers. Some of them may weary of fulfilling the prophecy, "Ye shall build houses and others shall inhabit." Columbia palaces are catching.

Messrs. Swain entered this new mansion about two years ago. There had been a shocking case of overcrowding in their Farringdon Street quarters—much cruelty to bevellers, motors, and the rest—even though they found room for the still large staff of wood engravers elsewhere, and although they had their immense works at Barnet, as I told you last month. There have been various published sketches of the new Swain establishment, or, at any rate, various notes thereon. I am not now attempting an exhaustive account. Enough if I may speak of just such things as I note which may be of interest to the professional reader and not reveal too much. Though for that matter the blunt truth is that the secret of success eludes presentment. It's as simple as the air—and about as subtle. It is indeed in the pervading air. And Swains themselves could no more give it you than I can. It's awfully difficult to give something which is part of and inseparable from yourself.

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The Office.

But I begin at the top, as we all like to do—and notice in the top studios the fine half-tone cameras (with non-vibrating stands and Rogers traversing gears), and Zeiss or Cooke or Dallmeyer or Ross lenses or prisms, and plenty of surplus slides and adapters and accessories multifarious. Large Pritchard pneumatic frames are here, for Swains are not competing in the glass-breaking business, so popular in recent politics. A great pantoscopic camera I note having a rest—just a passing index of the way the firm proves all things and even perhaps some things which are possibly a little before their time. They're a bit pantoscopic themselves. Hydraulic and electro lifts are noticed—one for heavier transport up the many storeys, the lighter one for the swift passage of instructions and blocks. Provision is made on every floor for escape to adjoining premises should the friction due to the rate of working or any other cause set the place on fire. And Rampart extinguishers are on every floor, plenty of them. The dark rooms are roomy, and there are conveniences for intercommunicating. A small safe or two obviously hold screens worth hundreds of pounds. It must be confessed that America has had the best of it in this screen matter, but I note that British screens are variously represented, and some of Mr. Dargavel's own devising are here, and perhaps we shall see still further change in this respect. That will take time, of course. A dead screen is about as rare as a dead donkey.

There was formerly glass all round in the top studio, but it has largely been blacked

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out. There was too much light from the wrong direction. The arc lighting of all the studios has won special praise from a past master in that particular study.

The line "operating" department has a fine large room, from end to end of the building, save that the western corner is reserved for printing. The line cameras include a Perken & Rayment, 26 × 23 inches, and a camera for 24 × 20 inches,

Columbia House.

with others a little smaller; and the lenses and prisms include Dallmeyer's, Steinheil, Ross, and Penrose, and probably the familar Cookes, as in the tone studio.

In the line studio one sees again that the firm has adopted the Pritchard pneumatic printing frame. The one encountered here is quite a monster. All along the side of this line studio, shut off by a wooden partition, is a quiet, comfortable retreat for the gentlemen of the brush and pen. There is always a fine row in the artists' room at Swains'. But do, for heaven's sake, give the "row" its proper sound. For that artists' row will show you "how," but it don't rhyme with how. By the way, that long line of artists sends my mind back to a story I have heard of a German technical paper which gave a fine view of the interior of the Swain etching room. The artist had fairly let himself go. He showed row upon row of rocking baths all worked from top shafting, and attended by myriad workmen, each one of them wearing Wellington boots.

John Swain saw, years ago, when the then zinco process came in and the old engravers began to suffer, that he would never be out of the wood till he was out of reliance upon wood. But all the same, wood engraving is still an important part of this great business. A suitable portion of the establishment is reserved to these expert woodpeckers. They have the assistance of some of the clever Royle-Richards machine engravers, the 30-inch line Richards "swinging" a 22 × 22 inch square block, and the 18-inch line swinging a 13-inch square block. Here is a good Schniedewend press and stand, for the task of proofing.

A room opening out of the wood engraving room is devoted to the old wax process engraving. And a lad happens at the moment of passing to be separating the fine letters which are employed for impressing characters through the wax.

One "goes delicately" in speaking of the machine etching, for really there

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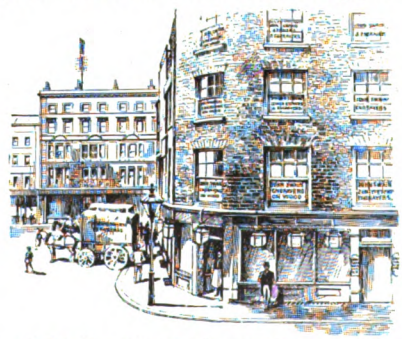
appears to be no limit to human possibility of misunderstanding. Let it be known that a firm has made the large outlay necessitated by the installation of Levy and other etchers—and there are five machine-etchers on one floor at Columbia House—and the next comment

Columbia House doorway.

one hears is, "Oh, then, the firm cannot be putting into the work that fine hand etching which has made So-and-So's plates what they are." Happily, most happily, the personal equation, the "hand" (using the term in its most literal sense), will never be dispensed with in engraving by whatever method. Photo-mechanical engraving is a collocation of words which has in it something of absurdity. But to speak plainly, the finest machine-etchers not only do their etching work with vastly more expedition than the hand, but they produce certain effects which seem unobtainable in the same degree by hand, let the time and pains of the operator be what they may. One of these etchers, by the way, takes 23 × 19 inches, and two take 16 × 13 inch plates. Two machine-etchers in another room represent a different working principle.

A fine 24-inch Fourways Powdering Machine (Levy) keeps company with the three Levy blast etching machines, and the "Fourways" is not a trifle in cost any more than in effectiveness, as readers well know. On the far side of the room are a row of rockers, the basis of fact on which the German artist founded his fancy. The Wellington boots are, however, of an invisible variety. One is pleasantly struck with the healthfulness, the absence of pungent or any unpleasant odour in this room where one would most expect unpleasantness. Hygiene has been studied throughout.

The mounting room is what one might expect. Royle and Wesel routers and bevellers, a Reliance router, a Wesel (Daniel) planer, and the usual other accessories are here, with also bowlers of Williams' make. There are other such bowlers elsewhere. For naturally there is quite a lot of other mounting plant, a



The old Swain wood-engraving premises in the Strand.

complete installation, in the basement, where the manufacture of Swains' well-known silver electros and of stereotypes is carried on. Just a word *re* the bowlers. Compare notes with the man most critical of British as compared with foreign plate-

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making machines, and you may take it for granted, or for grunted, that at least the British bowler is allowed to be a most serviceable and every way fine machine.

It should be remembered, by the way, in forming a mental picture of the Swain works, that Columbia House is at the corner of Shoe Lane and Little New Street, with no building at the back, but instead one of the many little crossways which Providence has given us to teach country cousins some need for patience and some respect for Londoners who *can* find their way. The significance is that there is a flood of light throughout the premises here, there, and everywhere.

We enter a litho department. There is much to be done in taking transfers or proving designs on stones. Quite a lot of photo-lithography is carried through. And it may fit in here to note the various large hand-presses. Quite recently the new Hunter proofing press, the Samson, has been put in, and having studied this machine, I am bound to congratulate Messrs. Swain or any engraver enterprising enough to make the purchase.

I am afraid of being dull. Catalogues and lists are not exciting. And it may be almost abusing a firm's courtesy to over-specify its plant. The foundry may be briefly dealt with. Of course it has the adequate machinery for all purposes. It was fitted up in these quarters two years ago, and the note of modernity is what one expects. The hydraulic presses call for a word. There is a fine double pump (Collis), and the men who cavil at a sixpence or eightpence for a little electro might be reminded that a hydraulic press alone runs a good way into the three figures; and that the block, the little despised electro, has perhaps gone through half a dozen journeymen's hands. Care has been taken to secure a good circuit of hot water by making avail of the metal furnaces for this subsidiary purpose. The boiler is one of Boyd's, and Boyds have supplied low-pressure hot-water heating apparatus. Besides the large copper depositing tanks there is a nickel depositing plant. The switch-boards and electrical equipment throughout the building have "thought" and "effectiveness" written all over them, with "outlay" outstanding also in equally large characters. Hard by the foundry, on the same basement level, is a very useful little workshop for the firm's engineer.

Already the firm is wanting more room; even now it has had to make a slight use of the roof. Still it is splendidly circumstanced as to elbow room and comfort in working in comparison with its lot before it entered Columbia House. It must manage there for a bit before fitting up the old General Post Office at St. Martin's-le-Grand.

The pleasure it is taking in its handsome home finds an expression in the plentiful adornment of its walls and the decoration of its windows with specimens of its colour work. Of course this is an obvious piece of wisdom; just the sort of obvious thing we commonly overlook. It is obvious the cobbler's wife should be well shod, and the engraver or printer should apply his own power of advertising, for his own benefit. Many don't. Swains do. And they issue a fine *Swain's Quarterly*, which undoubtedly has given great pleasure to its recipients, who really may be called its readers—judging, that is, from letters which come to the firm.

Last year Swains opened a branch at Glasgow. St. Dunstan of Fleet Street, London, having accorded his favour, they have invoked the northern St. Mungo. Reports from the north are very cheery. Q.

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Facings and Pacings.

By "Ion."

[Under this heading we are furnishing notes upon current happenings in electrotyping and stereotyping. Improvements in quality of work and attainments in speed of production will be represented in this page, with such illustrations as from day to day come to our knowledge.]

MAY I say ditto to the editor in his article on the "Hours Crisis"? This is a tide in the affairs of foundries which taken at the flood may lead us back to—a penny and an eighth, instead of the customers still having us fairly hydraulic'd.

The odes of Horace never fail to charm, and Eyre & Spottiswoode have found pleasure in his latest pæan of praise. Writing as a director of Adams Bros. & Shardlow, Ltd., art printers and bookbinders, Mr. Horace Adams records that "We have had four sets for a particular job on a sheet, three electros and one nickeloid, and we have renewed the electros three times, whereas one nickeloid has lasted right through the run. This," Mr. Horace Adams says, "is entirely unsolicited, and you can make what use of it you like. We appreciate a good thing when we get it."

Any printer can become a millionaire in the sense of securing a million impressions from a plate if he uses the sort of iron and nickel electro which nickeloid is. It is not a steel-electro. That phrase has been much used here and in America, but there is no steel-electro. Steel is not capable of electrolysis. Nickeloid represents a compound of iron and nickel. It is harder than steel.

Such electros, made under most favourable conditions for hardness, have latterly proved far to outdo brass for embossing purposes.

The extensive additions the E. & S. foundry lately made to secure better staff quarters represent about the sixth extension in ten years. By the way, I chanced to see a large sheet of *Tatler* picture pages, a pull from the plates before anything whatever had been done in the way of make-ready on the cylinder. Nothing had been put under or over the plate. I am bound to testify that had that forme been worked through the run and its quality maintained equal to that first pull (and I don't see why there should have been any falling off), the average reader of the paper would not have noticed anything unusual. The more critical would undoubtedly have felt conscious of a lack of "life," of stereoscopic effect, of brightness, here and there; but still would have thought the work passable. How different from the too common experience! Half of the picture in the first pull before make-ready doesn't seem to be there at all.

The pull was on a new press, a Walter Scott rotary from Plainfield, New Jersey. I believe this is the first printing of the *Tatler* upon a rotary. Messrs. Eyre & Spottiswoode are certainly giving us a lead in this matter, as in their lead-moulded electros and their nickeloid; both unique in the kingdom.

I must absolutely decline in this serious journal to give way to a friend who wants me to waste space on his joking. He will have it that Eyre & Spottiswoode are the oldest printers; that they were serving in their craft at Pharaoh's court. Says he: "When Moses and his great brother and the magicians threw down their rods before the king and the rods became serpents, there was no trouble about each

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identifying his own transformed piece of timber. At any rate, you could always see Aaron spot his wood."

The Illustrated London News will soon be printing its fine plates entirely upon Cottrells. Two or three are now installed, and another one or two are ready to be erected. The press-room is being altered throughout. I hope I may be able to speak of this again.

Where should the foundry be? In the basement, or on the top of a building? I go for having the foundry on top. Of course, where the principal business is that of making original plates, the top of the premises is wanted for the studio.

Wax and lead matrices, the laminated variety, are, I suppose, on offer throughout the country. I don't know if they may not represent an attempt to be and do almost too much. But I am open to conviction.

And what is this new Bendixon patent? A new stereotype, apparently. In that matter Mr. Wm. Gamble very properly pointed out that there were a heap of things in electrotyping or stereotyping practice worth re-examining and perhaps reviving.

What a singular thing it is, by the way, that when Ged, the Scottish goldsmith, invented stereotyping nearly two hundred years ago, his art was entirely lost for about thirty years after his death. St. Bride Library has a copy of one of the early Ged books printed from his stereotypes. He used the plaster method.

Mr. Harvey Dalziel has broken out in a new place, in the way of booming his stereos for colour work. I hear that his Earl Street, Finsbury, works have been busy right from the start. One factor making for success has been the thorough care to use only reliable woods. The firm has always presented its mounts with the compliments of their seasonings. In his "Dalsprites" Mr. Dalziel told of plates sent to an Edinburgh firm with a charming suggestion to those printers that the plates would be all right, for they had been sawn across from the bottom of the mount, and though they were curved to look at, while on the stone, directly they were on the machine the pressure of the cylinder would make them quite flat. Q.E.D., as Euclid used to say.

It is curious that there should be printers who can write up to electrotypers and say that they don't want a zinco or a wood block to be made from the drawing or photograph enclosed; they want an electro, and they know what the prices of electros are! Will the foundry attend to their request?

Among the less familiar but very interesting adaptations of electrotyping is the growing of electros upon amalgam of mercury under one of the Dodge patents. These patents are connected with the production of the Norwich films, for which Messrs. Le Franc of Fetter Lane, E.C., are agents in this country. Here is an extract: "In developing a plate, it is placed in a wooden box or frame, face downwards. It is placed over an iron tray in which has been placed a thin layer of mercury. The temperature is now raised to 150° F., and the vapour of mercury converts the parts acted on by light into an amalgam of mercury, while the parts unaffected by light remain iodide of silver. The plate having reached the right stage, when the highest lights are perfectly white, is at once placed in an electrolytic bath, when it will be found that the copper will deposit upon the amalgam or mercury, while the iodide will remain unaffected. When the plate is sufficiently built up it is cleaned, and

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the result is an intaglio grown plate, suitable for printing."

Further, among the claims we read: "A process for producing printing surfaces which consists in forming a picture from a design on a surface plate, by sensitising the plate, exposing the plate to the object to be reproduced, developing the same, and then building up the surface of the plate upon or about the photographic lines by electrolytic action, to form either an intaglio or relief printing plate as may be desired."

Readers of this journal who have noted their indexes will have no difficulty in turning up other matter which we have communicated in its columns in reference to these interesting patents.

Professor Herkomer twelve years ago gave a lecture in London explanatory of a method for enabling artists to make metal printing plates of their own pictures. He produced one notable picture called, I think, "Ivy," by the modus he illustrated at his meeting. The artist laid on pigment with considerable thickness in places. Metallising grains adhered to this pigment, and it was of the essence of the process that there was discrimination in the grains. In the shadows the grains were larger. This "Herkotype" was, after all, something of a revival of older experiments, although no doubt there were improvements embodied in the great artist's plan. It has appeared, however, to drop out of practice of late years, and probably never had any considerable vogue. None the less the artist is sure to hanker after any possibility, old or new, of being the actual creator of his own metal printing plate.

An electrotyper's pistonless hydraulic moulding press has been brought out by Messrs. Penrose & Co., Ltd., one free from the usual troubles incidental to ram and piston, with consequent difficulties in lubrication and leakages. This pistonless press has already proved a huge commercial success for many purposes such as bookbinding, rubber manufacture, tile-making, brass foundry, and chemical works, although it has only been on the market a very short time. Equal success is anticipated for it in application to electrotyping, and, as soon as drawings and patterns are completed, also for stereotyping. The principle involved is the utilisation of the pressure existing in the ordinary water mains (or a head of water in a tank). This is exerted upon the large area of an armoured collapsible cylinder, the head of which forms the bed of the press. In fixing, no excavation or special foundations are necessary; the press is simply connected to the ordinary water main or to a tank at the top of a building, and beyond this the expenses of installation are nil. No auxiliary machinery is required except perhaps where the water pressure from mains is abnormally low, or where a large surface has to be covered, and in such cases a small and inexpensive hand pump is provided, whereby any necessary additional pressure, readily indicated on the pressure gauge, may be obtained by one or two strokes after the full force of main has been exerted.

The initial cost is less than that of an ordinary ram press. The cost of maintenance is practically nothing, there being no glands or cup leathers to renew, and no item of any note for lubrication to allow for. The absence of friction, too, provides against the loss of power; and the complete absence of technical complications does away with the necessity of a skilled mechanic always at hand.

Messrs. Penrose will be very pleased to afford an opportunity for actual testing.

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The Mounting of Blocks: The Printer's View-point.

By G. Brown.

Uneven thickness—bad trimming—type off its feet—three- or four-ply material—trim to pica ems, not inches—nailing margins—bottom line suggestions.

EDEN PHILLPOTTS, whose fiction casts such a glamour over Dartmoor, in his latest book, *The Flint Heart*, discourses learnedly on the "View-point." The "view-point" is everything, and a man's way of looking at things very much depends on which side of the wall his lot in life has fallen.

It's all in the "view-point." From the engraver's point of view his blocks are the perfection of excellence; but only listen to what the average printer thinks of them. I don't mean the highly skilled City and Guilds man, with a hatful of diplomas and medals—he perhaps could see their good points—but just the ordinary everyday man, the average man who uses blocks, the man who must be satisfied to as great an extent as possible. And perhaps a few words from his point of view may not be out of place in a journal that appeals to the process engraver.

An experience of many thousands of process blocks has led the writer to the belief that it is only occasionally that the perfect block comes into the hand of the printer, and that in the average everyday work of the engraver there is a deal to be desired in the matter of mounting. Very seldom can much fault be found with the plate itself, but in the matter of the mount a few grumbles may be pardoned.

Perhaps the chief fault of the mount is the uneven thickness of the wood used. This in a mount of, say, ten by six inches often amounts to $\frac{1}{32}$ or even to $\frac{1}{16}$ of an inch, and in one extreme case that occurs to memory the wood at one end was almost a quarter of an inch thinner than at the other, and when it got on the machine the recording angel had to put in a bit of overtime.

Cheap wood from a careless timber merchant, and accepted by an easy-going engraver, who says, "Oh, the printer can underlay," often accounts for this defect, while sometimes it is caused by the use of a thicknessing machine that is out of order or carelessly worked.

Another fault is trimming that is not perfectly square, and when a block of this sort is surrounded by type it causes a lot of trouble in justification, while it always remains a danger when on the machine, and leads to pulling out of letters and other troubles. Perhaps an even worse evil is when the edges of the block are not dead square with the lower and upper surfaces, as no amount of "faking" can ever keep the type on its feet when justified against a mount that suffers from this fault.

Unseasoned wood also tends to trouble, and in the hot atmosphere of the printers' machine-room warping takes place even when the formes are on the machine, and no amount of overlaying or underlaying can remedy the matter sufficiently to get the best results from the illustrations.

As a remedy for such evils the process man should see to it that his wood is well

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CAVALIER

PAPER BY
ALEX. PIRIE & SONS, LTD.,
ABERDEEN.

PRINTED IN 10 COLOURS ON A
ROTARY OFFSET MACHINE.
MAKERS:
GEORGE MANN & CO., LTD.,
LEEDS AND LONDON.

PRINTERS:
JOHNSON, WYKES & CO.,
LEICESTER AND LONDON.

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JOHN CRE..
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seasoned, properly thicknessed, or better still—if his prices will stand it—built up of three- or four-ply material, of which there are several descriptions now on the market. These built-up mounts are also very carefully thicknessed to gauge, and certainly give greater satisfaction to the printer, especially if he has to store his blocks for use on some future occasion. Another suggestion, that, if carried out, would mean a saving of time and trouble to the printer, is that all blocks should be trimmed up to pica ems and not to inches and their divisions, as is the rule at present. If the engraver only spent a few hours in a composing room where blocks were being made up along with matter, he would readily grasp the reason. The printer's material, type, etc., are all to ems or multiples of ems, and to justify a block that has been trimmed to inches often causes much trouble and patching up with strips of cardboard or paper, a proceeding that takes up a deal of time, and is seldom satisfactory.

Another fault, from the printer's viewpoint, and this time in the plate, is the too great width of the margins that are left round the sides for nailing purposes. Where plenty of white space can be left round a block this margin does not affect the printer much, but when, as is so commonly the case, the illustrations are worked into closely set type pages, these margins cause a lot of trouble, and it is often necessary to send the blocks out to be trimmed down and re-nailed, or, if the printer possesses a proper shooting board, he does it himself, and with loss of time that causes a grumble. At the time of writing, an example is before me of a block whose nailing margins are over three-eighths of an inch wide, and quarter inch is quite common on many blocks. One-eighth of an inch, or even less, should be quite sufficient for nailing purposes. While on this point it might also be suggested that the bottom edge of blocks, that is, where the type-title comes, should be stripped quite flush with the subject, and the remaining three sides be extra well nailed. This would allow the printer to set his titles closer up to his pictures, and save much valuable space.

Another grumble, this time on behalf of the machine-minder. Is there any printer who has not had his soul vexed over the printing of vignettes? If so, I would like to meet him. Now why is it that the engraver cannot, or at least seldom does, provide us with vignetted blocks that will soften away at the edges without spending such a long time in making ready? and even then the results are often not at all satisfactory. Vignetted blocks are things abhorred in the machine-room, and many printers in estimating for this kind of work charge considerably more than for the making ready of ordinary half-tones. If the engraver will do something to improve and simplify the softening of his vignetted edges he will confer a boon that will be much appreciated.

Is it too much to suggest also that the engraver underlay the plate, that is, between the plate and the mount, so as to assist the printer in his making-ready? Such a thing has been done, although it has not come under the writer's experience. The engraver knows his plate and the portions that have to be brought up or lightened, and in his hand it would be a comparatively simple matter to assist a little in preparing the block for the printer.

Although addressed primarily to the process engraver, these few grumbles are also applicable—in so far as they relate to the mounting of blocks—to the electrotyper and the stereotyper, who are even

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greater sinners than the engraver in the matter.

Doubtless, it will be said, our prices do not cover such exactitude as the printer requires. Well, the remedy is simple: charge a little more, and provide the printer with perfection. It will save him money, time, and worry, and for such saving he ought to be willing to pay more.

"Rush" Work in a Daily Newspaper Office.

By Hannen Swaffer, Art Editor of the "Daily Mirror."

(*Concluded.*)

A BLOCK was etched in a railway train by a London firm some years ago for the *Daily Mirror* on the day when Mr Chamberlain had been addressing a very important meeting in Birmingham. On this occasion the photograph was developed and printed, and the process negative and the print on metal were made by a local firm, and only the etching was done in the train. By these means an hour was saved.

Our engraving staff has made a block as large as the centre double page of the *Daily Mirror* in an hour and a half, and this double page has been changed twice in one night. This double-page block, which is 22½ inches by 13½ inches, is the largest photographic block that has ever been used in a daily paper.

The *Daily Mirror* has used a block of this size to illustrate such events as the King's funeral, the lying in state of King Edward, the sinking of the French submersible *Pluviose*, the opening of Parliament, the finish of the Derby, and all sorts of events which at the time have had a very important news value.

It is six years since the *Daily Mirror* engraving plant was laid down. This was done because it was found that the method of employing outside firms was not so satisfactory as the idea of having the whole process under a newspaper's control; and in these six years the time of block-making in the *Daily Mirror* office has been brought down roughly to half what it was.

There are all sorts of mechanical reasons, of course, for this; because it is being appreciated more and more that time-saving is money-saving, and that the employment of time-economising machines is becoming more and more profitable. The employment of an etching machine, for instance, has been found to save about seven minutes; and when you have to go to press, and yet you daren't go to press without a particular thing of great importance, that seven minutes makes all the difference.

But Mr. Stewart always points out, when people talk to him about what can be done in block-making, that time-saving machines are no good unless you have a time-saving staff. The enthusiasm of a staff will do wonders. Once you have pumped into your staff all the oxygen of enthusiasm they can stand, you have solved the problem which underlies all schemes for improvement.

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Process Printing.

From the Standpoint of a Letterpress Printer.

By J. R. Riddell.

(*Concluded.*)

MACHINES.

No printer can afford to ignore the correct setting of his rollers; these should be in the best condition (a good set of rollers correctly set will save hours in making ready) and set so that they just touch or "kiss" the slab-forme and riders, particular care being given to the one next the cylinder, so that it will work in unison with the rider. If rollers are not perfectly controlled by the riders they will spin round when the bed reverses, causing rollers to strike the edge of the plate, making a mark somewhat like a slur, and which will rapidly wear the plate.

MAKING READY.

Hard packing, intelligently used, is the only covering for a cylinder which a process-printer can consider. American press-board or manilla sheets, finishing up with super-calendered paper, makes a good tympan, care being taken that no more sheets are carried than will bring the packing level with the cylinder flanges; if a cylinder is overpacked, it places the cylinder and bed out of unison, with the result that a slur will develop. It is sometimes advisable, when necessary, to add more sheets to make a job "solid," and the cylinder packing not allowing for it, to take off two or three of the hard sheets and replace with a softer paper; a sheet of fine blotting paper has been found of advantage in such cases. Making ready is an intelligent adjustment of pressure to suit the various tones of the original, and, if it is carefully done, it is seldom that a printer will be troubled with "slurs"—that is, if there is not some defect in the machine, and he has correctly underlaid the blocks so that there is no "rocking movement" as the cylinder passes over them.

Many printers think that to get the best results a cut-out overlay must be used for all and every job. Close observation and experience do not bear this out, and, in relation to colour-work, it has been proved that overlays can alter the colour values of a picture; and in some cases they will eliminate the atmosphere of the original which has taken the engraver much time, care, and skill to reproduce. It is in this operation of making ready where the engraver has so often cause for complaint against the printer who thinks it necessary to have so much impression that it "squashes" the work, making the print look "spongy" instead of being clean and sharp. It would be well if printers would study the formation of the half-tone "dot" under different pressures, and note how the ink "lifts" under the various conditions. To ensure the best results in half-tone printing, see that the value of the dot is obtained by the proper strength of pressure and ink, and clean, sharp work will be the consequence; in some cases, this is best obtained by careful underlaying, and a single-sheet interlay with the lights cut out and the darker tones patched up.

Given good plates, ink, and paper, it has been found practicable to get long runs of

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good colour-work without resorting to the ordinary cut-out overlay.

Inks.

Inks for process printing should be of a soft nature, and must work clean. In three-colour printing the standard colours should be adhered to. No "faking" ought to be allowed. These inks have certain characteristics which should not be interfered with. Allow the ink-maker to supply them. He knows by experience the best base from which to make three-colour inks retaining the necessary qnalifications.

At the same time the printer should not blindly, and without reasoning, use the inks supplied, for no ink-maker can supply a universal ink that will suit all conditions and grades of paper. It is therefore necessary that he should understand the inks he is working with, as there will be times when he must modify them. Great care should be given to the first printing; unless this is done the results can never be satisfactory. For if the first printing does not "go into" the paper and "dry flat," it is impossible to get the other colours to "lift" in their correct values.

It is advisable to keep the ink duct well filled; this will ensure a regular flow of colour, and the duct ratchet should work on five or six teeth which will bring the ink to the slab in the best condition for thorough distribution.

Printing.

When running off colour work, each day's work should be kept separate. A good plan is to place on the edge of the sheet a distinctive mark for each day's work. The next colours should follow in the same rotation, with about a twenty-four hours' interval. This usually allows for the best conditions in superposing the other colours.

One cannot too much emphasise the need for care in keeping a regular colour, and if there is one colour of more importance than another, it is the yellow, which is so often neglected, owing to the detail being more difficult to see.

Driving.

This is a matter requiring careful consideration if delicate register work is to be successfully attained. It is now generally allowed that the best method is to run each machine from a separate motor by means of a belt. If a number of machines are run off the same shaft, there is a difference of speed according to the load that the shaft is carrying. Therefore, if a machine is stopped or started, the other machines will show a difference in register until the shaft retains its momentum.

Difficulties to Contend with.

Marvellous as the advancement of process work has been, it is believed to be yet capable of still further progress; but this can only come about by a "getting together" of those concerned in the production of the work. Particularly should there be a closer touch between the engraver and the printer.

Those who know most about the process readily acknowledge that there are limitations, and work accordingly. There is no more trying individual to the engraver or the printer than "the artist," whom some firms think it necessary should criticise the reproductions. This is especially the case if he is a "faddist." It is only fair to say that the higher the grade of the artist the less "fiddling" there seems to be. It has often been noted that there is nothing more fatal to the printing con-

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ditions of the plates than excessive alteration suggested by one who does not appreciate the limitations or the possibilities of the process. It sometimes happens that a lithographic artist has been deputed to deal with the engraver's proofs. It is not reasonable to expect this artist can put the results of his life's training aside, and give a helpful and constructive criticism. The fundamental principles of the two methods of reproduction are opposed to each other; clearly, the engraver and printer should be entrusted with the entire responsibility of obtaining the best possible results. This is not a theory, but is a fact which has been acknowledged for some time in America, and in some cases has been put into practice in our own country.

There are sometimes complaints that a run of three-colour work varies in tone throughout the bulk. It is not always a variation of the ink supply that is at fault. A difference in the "drying" conditions of the previous colour printed will change the colour-value; as also will a difference in register by as little as "half a dot." Particularly will this show, should the plates not be in exact register; therefore it is always advisable (if at all possible), when the original contains fine black lines or very small black lettering, to run the graver through or "break up" the lettering lines in the red plate. For if such a subject is printed many up on a sheet, there is certain to be trouble with the register and colour value. Again, differences in the paper surface will show a variation in colours.

The three-colour process is a beautiful, although delicate one, but further progress must come from the workers responsible for obtaining the best results. It behoves all who take a part in the work to do their best to help the "other fellow" over the difficulties with which he has to contend.

Finally, let the engraver "get it in his negative," and there will be less fear of the printer turning out work that will not reflect credit on all concerned.

A Wonderful Variety Machine.

FULL OF WISE "SAWS" AND MODERN INSTANCES.

WHY play with jig-saw puzzles, or any of the more exacting brain twisters—for that matter, why worry about any expensive form of sport or recreation, when one can have all the healthy excitement and incessant surprise which come from studying and operating the Miller Saw-Trimmer?

You never seem to get to the end of what it is, or what it can do, so "cliver and contrivin'," so almost diabolically 'cute, is this little wonder.

You have a circular six-inch saw, a little thicker than is usual, and, of course, a table top that is moved up and down. The first distinctive "notion" you strike is that there are three trimmer blades insetted in—that is, looking out from—the surface of the saw. You can work the saw without working these trimmer blades, but the purpose of the inventor, and the great comfort to you, is that you can also work them together. While your little one-third h.p. is circling the saw, and thus cutting your mount with perfect squareness, though not to "point" precision, the little trimmers follow on under the same drive and "true up" the unshifted block to absolute point or even to half-point. (And see what Mr. Brown has to say on page 44 about trimming to pica measure.)

The way the points are determined is quite cunning but very simple. A disc or barrel revolving horizontally is divided on its periphery into twelve spaces. The complete revolution represents a pica, or twelve points. Brass sections of a screw represent the point adjusters. The part carrying the gauge travels along an adjustable groove past the saw-trimmer head. This carrier can be lifted for quicker adjustment.

In cutting-up practice it often happens that blocks are held by an operator for the saw to cut them. That is not scientific. Here a holding

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vice with a simple ratchet movement clamps the object tight in an instant. The thinnest rule is clamped as tight as a wide block.

The teeth of the saw are "spread" before filing; so that their outer edges protrude beyond the plane surface, as your straight-edge reveals in a moment. The saw therefore files and fines the work; it smooths the saw-cut so that it renders a bowler needless.

LIKE SOLOMON'S TEMPLE.

A block I was watching was sawn and trimmed to 16 picas. Let me say there was no spanner or "tommy" then or any time used, for the machine is like Solomon's temple with everything made "just so," and everything needing to be done to it when once it is put in your works is done by hand. In this case the guided revolution of a dial of two or three inches diameter, and divided into twenty-four sections, determined the exact conjuncture of parts which should result in a 16-pica cut. Now as to brass-cutting. With the single cutter instrument, brass sections are commonly turned over a bit to right or left at the ends, but I carefully noted a parcel of perhaps forty rules cut through by the wide-toothed saws fitted in for this purpose, and found those sections absolutely straight and square from end to end.

There is a nice little surprise in the mitreing that can be done. The gauge carrier is now shifted to a diagonal position, and holes in the plane table top serve in which a catch may operate, and hold that carrier fast. With a slight accessory brought into play it is now easy to see that a good angle cut for mitreing can be made, clean and sharp: the rules to be cut being adjusted to gauge. Forty pieces of eight to pica are a convenient quantity to handle. By the way, you don't rush the saw through all this metal. Go a bit slow. Remember such a saw is a beautiful tool. Its life is very long where there is care. There is a smart device to keep in perfect condition the brass-cutting saw, which is not intended to cut anything but brass.

As a detail, Oxford borders can be cut to interlock by use of the Miller gauge. Note all this variation of cutters.

A further surprise is as to the clever outside mortising which can be done—the notching out of blocks for insertion of type, every notch to absolute point depth. The "comp." can get his job done to point while the block is cut out, and then can drop in the matter knowing that he is giving it a fit, instead of its giving him fits.

THREE ROUTINGS.

Surprise number four—one might perhaps have extended the number—is concerned with the router attachments. Out go the saw trimmers, and into the "head-piece" the little routing blade is fixed, that head-piece is swung round, the ratchet hold-fast is applied, the table's height is adjusted, and off you go. You do your routing, in and out and round about, or in an absolute straight line, or in a circle, as may fit the need. No need now to buy expensive brass circles, possibly only wanted once. Make them.

There's no need to talk of the jig-saw surprise other than to say that this saw-trimmer will quickly give you a centre perforation in which your jig-saw can get to work, piercing blocks to point measure accurate, square and upright. A jig file is yet one more expedient.

The raw hide gear is a valued factor in this machine, and other parts are of aluminium for lightness' sake. To conclude: there are stop gauges, there are screws for controlling undercutting, and it is rather hard to think of what there is not; and yet not hard. For one thing there is *not* any difficulty in quick mastering of the "Miller." One was lately put in at a northern works. The buyers, large printers, were politely asked some days later if some member of the staff of the vendors, the Canadian and American Machinery Company, of Bouverie Street, E.C., who might be near, should call and put the thing through its paces.

The reply was a polite variant upon "What do you take us for?" "We've tumbled all right, and straight off, too." In fact, they had had quite a zestful sporting time, finding out its little advantages, the pleasant surprises, the adaptabilities. We hear the machines are worked all the time where they get in. That's the way to get good interest on the £120 which buys one.

Americans talk of life being "Just one darned thing after another." The users seem to think that their Miller is just one charmed thing after another.

ALPHA.

[The conclusion of Mr. Harold Hood's article on "Photo-Engraving in the Provinces" is unavoidably held over to March issue.]

THE very first half-tone issued in a London daily was produced by the *Daily Graphic* October 20th, 1890. It was a portrait of the late W. E. Gladstone, and was printed on the flat, as a supplement. A half-tone portrait of Archbishop Nicanor, of Kherson and Odessa, was published in the body of the paper on January 17th, 1891, the first half-tone actually printed on a rotary machine.

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Jubilee Edition of the "British Journal" Photographic Almanac.

WE imagine there can be few with a practical interest in any application of photography who omit paying their modest 1s. 6d. for the cloth-bound edition of this Almanac, 1s. paper bound. But in case there are any so unkind to themselves as this would reveal, let us impress that the 1911 issue (from 24 Wellington Street, Strand, W.C.) is the Jubilee edition. Naturally it is of even more than the ordinary interest. Can it be that the very stoutness of the book, and the consciousness that 1350 pages of often small type must present a vast mass of "matter," frightens some who should buy? Then let us hasten to explain that there are indexes at the end, not only to the "text," but to the advertisers, and also to the goods advertised, this last a most serviceable guide, with other indexes. Besides, the art of the letterpress printer has made such strides, and his variety of fancy is so great, that there is no tedious sameness in this volume anywhere. A book or an article is "as long as it reads," and a book is only as big or small as it is manageable or the reverse, and this Almanac is eminently manageable. Mr G. E. Brown, the editor, writes pleasantly of the story of the journal under the able editors whose worthy successor he is. Incidentally we learn that the Jubilee might have been claimed for last year, but as the first Almanac was issued as a large paper sheet and not as a book, the supersensitive conscience of the editor—surely the finest thing in consciences since the day of the all-blacked actor who played Othello—decided not to claim any date prior to the book "format." Hence he passed over the actual birth of the Almanac in 1859, that wonderful year which saw Darwinian evolution presented to the world and various other epochal happenings. We shall have occasion to revert to the Almanac. We may now mention that there are naturally data regarding such things as the comparatively new, highly sensitive solutions—the "pina" family and their relations.

"Formulæ for the principal photographic processes," especially "orthochromatic processes," are given.

Incidentally we note that Messrs. Hood of Middlesborough use this medium for extensive advertisement (pp. 335 *et seq.*) of their "poster portraits" and other productions, very properly not forgetting to mention in the advertisement that "the Hood output for 1910 has been by far the biggest in the firm's history." Obviously in the hard-headed north there are some great believers in the value of this Almanac for assisting the photo-engraving business. The London Studio and Messrs. Hamel of Nottingham are other engraving advertisers. More anon about this Almanac.

Patents.

15,393, 1910. PRESCHLIN. METHOD OF GIVING PRINTING ROLLS THEIR ORIGINAL DIAMETER AFTER THE REMOVAL OF THEIR ETCHED OR ENGRAVED SKIN.

Method of giving printing rolls, comprising a mantle and core and deprived of the skin containing an etching or engraving, their original diameter, which consists in exerting a progressional pressure on the circumference of the roll, thereby enlarging the diameter of the handle and loosening it on the core, whereupon the mantle is slipped on to a core of large diameter and pressed down on the same by drawing it together with the new core through a matrice ring.

7120, 1910. CALICO PRINTERS' ASSOCIATION, LTD., & KENYON. BLOCK PRINTING UPON TEXTILE FABRICS.

Claim includes a process of printing textile fabrics with a semi-resist applied by one block (or by one set of blocks if more than one semi-resist is involved by the elaborate nature of the pattern) to all those parts of the design which are to have the lighter shades of colour, and printing with another block (or set of blocks) those parts of the design which are to have the darker shades of colour and simultaneously overprinting the semi-resist portions and subsequently fixing the colours.

15,673, 1910. RECKARD. PRINTING MACHINES FOR PRINTING UPON ROLLERS.

Relates to improvements in printing machines for printing accurately upon rollers, and more particularly for printing designs upon rollers to be thereafter etched and used themselves as printing surfaces, of the type having a reciprocating bed and provided with means for defining the position of the transfer base on the bed.

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My Causerie.

BILLIARDS—AND A PRINTING CUE!—I have never seen a more telling use of three-colour and appropriate colour type-surround than the Riley billiard advertising folder exemplifier. This is just the thing to send orders for the combined billiard and dining-table streaming in to the Accrington Works. I lit on the folder in a *Cassell's Saturday Journal*. The sheet is about a triple large post 8vo, backed. There are six or seven three-colour subjects, presenting the billiard table in different aspects—neat, attractive, handsome, convincing. In a word, business-like.

There is this about it too—it suggests and almost proves that the billiard tables are good. There is a wonderful unity in the average man of business. He is not, as a rule, scrupulously nice and particular about the output of his advertising matter, and careless as to the make of that which the advertisement is to sell.

Besides, there is the other thought that no one can afford such fine and necessarily costly advertising who is not doing really good business. No one can be doing really good business, permanently good business, who is not giving good value. At any rate, the exceptions need hardly detain us. I have personally shed nearly all my old notions in this regard since I came into closer touch with advertising. I used to think that the widely and expensively advertised article must be dear, seeing that it was saddled with its proportion of all that advertisement outlay.

I think there is a sounder philosophy than this, and a philosophy which it is wise for the three-colour block-maker particularly to comprehend, and at the proper opportunity to impress. These expensive advertisements are really paid for by the rivals who neglect the opportunities and lose business to the advertiser. They are partly paid for by the public, no doubt, but on a large sale the proportion of added cost becomes inconsiderable. Moreover, as the scale of business grows, the maker has more sunk capital at stake; more to lose through letting down his quality. He comes to be a Browningite, though he may never have read Browning. He comes to realise that "it's saner to be good than bad."

The making of the final note or two of this short causerie happens to be among the last things remaining to be done for this journal. It befalls, therefore, that this is the place in which mention ought to be made of the latest reported developments regarding our trades. Here before me is the third issue of the *Daily Herald*, a little halfpenny daily evening paper which the London Society of Compositors is issuing. In a column of notes about the threatened strike which are headed "Striking Paragraphs" I read:—

"They're all coming. They cannot keep out of it. The fighting spirit is contagious. We hear on good authority that the National Committee of the Federated Electrotypers and Stereotypers have given their London branch, nearly a thousand strong, a free hand.

"This Union, although little advertised, is one of the best organised in the kingdom, and represents about ninety per cent. of the London trade."

The next paragraph reads: "Since the above was written a general meeting has been held. Finest on record. Result: Notice to be tendered forthwith. Bravo!"

Assuming the accuracy of this statement, it only lends force to the suggestion in the leading article. Whatever may be the immediate outcome of these labour troubles, no thinking and well-informed man can believe that a substantial reduction of hours can long be deferred. Having failed to meet their unemployment and under-employment difficulties by making unemployed men special levy allowances, and having succeeded hardly better by the policy of restricting overtime to eight hours, the unions seem to have arrived almost by process of exhaustion at the policy of reducing the normal working day in the hope that a double shift usage will absorb some of these out-of-works.

May I adopt here, as the opportunity offers, the argument of the leader that if sixpence is not promptly put down while a shilling can be picked up in return, the sixpence may a little later have to be put down and nothing picked up? And I speak as one who has worked for years in an electrotyping house.

Though our trades had not seemed to be directly concerned until the electrotypers and stereotypers handed in notices, the position would have been grave indeed for our particular craft in any case. Our connection with the printer is, in the nature and necessity of things, so intimate that when he suffers we too must suffer. We are interdependent, whatever airs of independence we may sometimes put on. This is to us also a time of difficulty, of suspended or exasperated business—or both—a time therefore of absolute danger. "To times of danger earnest men belong." The flippancy and the sneers which have marked the contest so far have been quite unworthy. I respectfully appeal to every reader not to fall below himself in this crisis, but to show at his best, remembering that the golden rule is not simply a sublime ethic but is fundamental common sense. FRANK COLEBROOK.

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Publications.

IN the "Penrose Pocket Book for 1910" there is nothing of an aggressively advertising nature. The diary pages are rearranged so that the Sundays come at the top, and each page covers a complete week. The diary pages are ruled in red and blue. The postal and other information is more compact and accessible. There is a page devoted to the literature of photo-engraving, giving names and cost of periodicals and books. A page has been added dealing with "Help in case of Accidents." The notes and formulæ for process workers have been thoroughly revised and much new matter added. The book contains the whole practice of process work in a nutshell. The aid of several well-known workers is sought in keeping the information up to date.

"MERCK'S INDEX" is to hand (Edition 3). We have pleasure in drawing attention to this valuable work of reference, most serviceable to all whose business interests connect up with pharmaceutical, or generally with scientific, laboratory, or technical subjects.

The style, nomenclature, and scope of the book are similar to those of previous issues, but this edition has been entirely revised and brought up to date by the inclusion of a large number of new references. Introductory remarks on page 3 should be consulted for information as to alterations that have been made. Although the book is in German, it may probably prove of interest to a number of our readers. It is on sale at 6s. 6d. per copy, post free, and orders should be addressed to the London office, 16 Jewry Street, E.C.

THE KING among the Xmas numbers was the special issue of the *Sphere*, printed by the King's printers, Messrs. Eyre & Spottiswoode, Ltd. A great feature was the remarkable pains taken with the cover. Splendid register is evidenced in the words "Xmas Number," composed of bright-coloured precious stones, outstanding brilliantly against the dark and very even green of a Christmas tree. All the page pictures have suitable holly-leaves-and-berries border. Some pages show how effective red and black can be when the artist is gifted and painstaking, and the plate-makers have done their work well, original and duplicating. This foundry is the only one in the kingdom in which the moulding is in lead, instead of being done in beeswax or ozokerite. There is a weird page picture depicting apparently a modern detective mind at work (more Sherlock Holmesism), and we mention this to impress how the violet ink used for this page subtly and unmistakably suits the topic. There is an ivory-like delicacy in the Edmund Dulac picture, "The Red Butterfly." It has a wonderful quality of what, till we can find a better word, we shall call cleanness. Of all season's pictures we have seen, it is the one we could most readily live with.

School Notes.

IN February, at the Central School of Arts and Crafts in London, some Wednesday evening lectures are being given in connection with the Book Production School. The course is of the highest interest and practical value.

AMONG the gifts to the L.C.C. School of Photo-Engraving are four fine colour collotypes from the Medici Society. These are representative of the work supplied by England, Austria, and Germany.

AN exhibition of Book Production, showing the work of the schools in London, and also examples of fine printing, both early examples and modern work, is to be held very shortly at the London Central School of Arts and Crafts.

THE *British Journal of Photography* has published some very interesting notes upon the progress of plate-making or lithographic establishments abroad. The Royal Academy for the Graphic Arts and Crafts at Leipsic enrolled nearly 600 students last year, 100 being women. Its photo-mechanical plant is now worth about £2500, something more than the odd £500 having been added last year. The majority of the students, however, are studying lithography. The École Estienne in Paris is rejoicing in the completion of the new buildings erected for photo-mechanical studies. Students of ages 14 to 17 are admitted by competitive examination. "Paris need no longer envy" London, the prospectus exclaims. The Bissell College is an institution conducted by private enterprise in America. It turns out about 300 photographic or photo-engraving students yearly, and apparently it gives a nine-months course for £30.

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Brevities.

WE hope to furnish in next and subsequent issues an index of such of the current photo-engraving literature of the world as we think may be worth our readers' notice.

MESSRS. W. G. PROVERBS, LTD., makers of hard metal nickel-faced stereos from half-tones, line blocks or type, have taken and fitted up premises adjoining their workshop, 143-4 Lionel Street, Birmingham, and naturally are alert to apprise the trade of these extended facilities for service.

THE witnesses to "The Value of Illustration in Advertisement," called into court by Carl Hentschel (182 Fleet Street, E.C.) in his latest advertising pamphlet called by that title, make a formidable array. They include Mr. Murray Allison of *The Times*, Mr. Wareham Smith of the *Daily Mail*, Mr. Gordon Selfridge of Selfridge's, Mr. William Dixon of Oxford Street, Mr. Gamage of Holborn, Mr. H. E. Morgan of W. H. Smith's, Mr. Benson, Mr. Derrick, Mr. Powell Rees of Advertising Agencies, and Mr. Simonis of the *Morning Leader*. In different language these authorities all give the same evidence in substance.

"ARTISTS WHO DRAW their own Christmas Cards" is a heading under which Mr. Sydney Boot wrote a delightful too short article for the Christmas *Strand Magazine*. Some of the illustrations to this article are in colour. Alan Willis writes in the same publication two short pages—hardly more than one, in fact—but broken up and illustrated with six large representations of "Colour blots." He explains how the multi-colour effects and freakish accidental designs which he shows us were produced. A "Dickens Party for Children" is enriched with two-colour drawings in profusion. "Hiding a Heretic" is handsomely adorned with six large three-colour pictures.

IMITATING DAYLIGHT.—The Bureau of Standards at Washington has been experimenting on the best sources of light to combine with the mercury vapour arc in order to produce an imitation of average daylight. It has been found that the colour of the light given by the Welsbach mantle and carbon, tungsten, and tantalum filament glow-lamps is in each case closely complementary to that of the mercury vapour arc. When light from either of these sources is combined with that of the mercury arc in proper proportion a satisfactory imitation of daylight is produced. The best proportions have been found to be one candle-power of mercury light to 0·57 candle-power of Welsbach light, 0·54 of tungsten lamplight, and 0·50 of carbon glow-light.

HARD THINKING. — A current *Gentlewoman* sent to us shows plenty of things for the engraver to study. The half-tones, however, are on the grey side and show some marks of haste which is very understandable in this time of rush. There is one thing we must quote. A full-page illustration of an election meeting is enriched with this colloquy. Voice in the crowd: I don't think. Candidate: No. You *can't* think. Voice: I can think. Candidate: Then why don't you think? Voice: I do think. Candidate (with finality): I *don't* think.

THE AXEL HOLMSTROEM ETCHING MACHINE. NEW AGENCY. — We are informed by Messrs. C. Janzer & Co. that they have resigned the agency for the Dr. Albert Etching Machine, in favour of the Axel Holmstroem Etching Machine. Engravers are invited to see the machine of Axel Holmstroem in the showrooms of Messrs. C. Janzer & Co., Gough Square, E.C. We hear that in four months over seventy machines were sold in America, and that amongst other houses on the Continent the following well-known firms use them:—Messrs. Husnik & Hausler, Prague (2); Bruckman, Munich (2); Meisenbach, Riffarth & Co., Munich, Berlin, Leipzig (4); Aug. Scherl, Berlin (4); Studders & Kohl, Leipzig (4); *Illustrierte Zeitung*, Leipzig (3); Reymond, Paris (3); Ruckert & Co., Paris (4); Victor Michel, Paris (3); Laureys Frères, Paris (3), etc.

LUMINOCHROME is the name given to a process brought out by the Senefelder Printing Co., of 34 Memorial Hall Buildings, Farringdon Street, E.C., of which Mr. C. J. Schuver is manager. The process is intended for reproducing oil paintings and water-colour drawings of every description. It is claimed that this method of reproduction, which is the outcome of several years' experimenting, while only requiring the use of four to six colours according to the originals, combines the softness of the multicolour lithographic reproduction with the faithfulness of photography. It has, its producers contend,

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the advantages of both litho and block printing, while considerably less expensive than either, and therefore specially appeals to buyers of large quantities of colour-printed pictures, presentation plates, etc., in which the combination of low price and good quality is so very important. The Senefelder Printing Co. are makers and printers of colour blocks, and do all kinds of colour printing, and have recently built and equipped an up-to-date factory, their business having outgrown their former premises.

NEW "BROWN" HALF-TONE SCREENS.—We call attention to the fact that Messrs. F. E. Brown & Co., of 5½ Guthlaxton Street, Leicester (late J. Brown & Co.), are issuing to the trade this January a circular and price list with information as to their Diamond Engraved Screens, prepared by a newly discovered process which cheapens considerably the cost of manufacture. They have sent us a specimen of their 200-line screen, which certainly appears to be beautifully made, the lines sharp and clean and very opaque; the cement perfectly clear. These are permanently engraved screens. The sealing is guaranteed for three years. The cost is very moderate. The screens are English made throughout. The makers emphasise the point that direct business between the makers and the trade naturally enables them to submit attractive terms. Messrs. Brown are only wishful that their screens shall be put into fair competition with any others. Stock screens of standard sizes and rulings will be submitted on seven days' approval.

EXTRAORDINARY GRINDING.—To users of fine-lined screens it may be interesting to read this note on a related art:—

"In making diffraction gratings for examining the fine details of the spectrum of light, Professor A. A. Michelson contrived a wonderfully delicate method of grinding the screw, the turning of which controls the advance of the diamond point that scratches the parallel lines on the glass. By grinding with a nut, kept wet with soap and water, for several months, a first approximation to the desired accuracy was obtained. Then a correcting nut with an arrangement for rubbing harder on one side than on the other was applied, and finally the errors were brought down to the 2,000,000th of an inch. To secure the rigidity required for a screw long enough to rule 250,000 lines on a grating fifteen inches long, the screw must weigh thirty or forty pounds. Nine-tenths of this weight was supported on mercury. Great trouble was experienced in finding suitable diamond points. After the first year not a good one was found for six years. Finally, through Sir William Crookes, a satisfactory diamond was obtained from a mine which yields unusually hard stones."

FORGOTTEN COSTS.—May it not be, asks *The British Printer*, that one cause of engravers cutting prices so seriously, is failure adequately to recognise and remember some of the less obvious but serious non-productive costs of their establishments? If a router has been invoiced, say, at £90, these are the figures, large as life, and the £90, less its depreciation, come before the firm every year. But take such a little thing as the wiring for incandescents. This is one of the less obvious costs. There is a case in mind where 7s. 6d. was glibly declared to be the cost "per point." First, it is to be noted that points and lamps are not the same thing. From one ceiling rose (or point) perhaps three lamps may be worked. Seven-and-six per lamp would be nearer common sense; 23s. or 24s. per point would be about the probable installation cost. Then consider the perchloride and other pipes! The busy engraver may easily fail to put all his plumber's and builder's and other bills together at the proper time, and as the months roll by, may be far under the mark in considering his plumbing outlay with all the "making good in all trades" which had to be effected at the installation of the system. His engraving establishment is often perched high up; he therefore had to carry acid-resisting pipes, say 6-inch external and 3-inch internal diameter, glazed internally, down three or four floors to the manhole. To guard against accident he probably established a twin system. His establishment may not be very large, but he may easily have to spend over £100 in such plumbing. Pipes that are out of sight, the mind of the estimating clerk does not grieve over. The very lead on the floor under etchers or tanks, if, as is wise, seven or eight pounds to one square foot is the quality put down, easily represents a five-pound note in one shaky-looking piece, trodden under foot of men and perhaps forgotten of the office.

The very equipment of the aerograph brushes, not being such as is commonly called for, and having to be proof against leakage under high pressure, may represent a ten-pound note, quite apart from the expensive compressor and the brush. These are details, but engraving is a business of detail, and profits have to be made up of remembrance and respect to detail, in all meanings of the word respect.

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THIS illustration shows Mr. Philipson, senior partner of Messrs. Philipson, Son & Skilleter, engravers, of Newcastle-on-Tyne, leaving Central Station for a tour in the Colonies. Mr. Philipson is High Chief Ruler of the Independent Order of Rechabites, and has been appointed, along with a colleague, to visit the following places: India, Ceylon, New Zealand, Australia, and South Africa. The tour will extend over a period of six to seven months.

ABOUT TANTALUM. — Tantalum is a "rare metal" of slight importance, the only practical use to which it is now known to be put being in making filaments for incandescent electric lamps. The efficiency of the tantalum lamp is greater than that of the carbon lamp, but somewhat less than that of the lamp with tungsten filament. As more than 20,000 filaments of twenty candle-power can be made from a pound of tantalum, the market is not large. It is at present probably supplied, says *The Scientific American*, by rich manganotantalates from Western Australia. No tantalum minerals are known to have been produced in the United States in 1908, according to F. L. Hess, whose report on various rare metals has been published by the United States Geological Survey. The tantalum used in the manufacture of lamps is made in Germany.

Correspondence.

The Editor, "The Process Monthly."

AN INQUIRY.

DEAR SIR,—It is desired to use a draughtsman's tracing on tracing paper, as a negative *à la* Vandyke, but on a copper plate, so that a copper transfer can be pulled and the same transferred to a zinc or a stone for litho.

The work will be chiefly line; but continuous tone will be sometimes used, using a screen negative; in this case, of course, a transparency will have to be made.

I am acquainted with line and half-tone etching on zinc or copper; also with photogravure, using the carbon process.

My results when using the tracing on the coated copper have not been satisfactory on either grained or ungrained plates. There are soft spongy edges with letters and lines, like that obtained by the Vandyke, instead of clean-cut work. Can you assist, please?—Yours truly,

W. W.

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Estab. Jan. 1894.
"The Process Photogram."

THE PROCESS ENGRAVER'S MONTHLY
THE PROCESS PHOTOGRAM ESTABLISHED JAN 1894

VOL. XVIII. No. 207.
MARCH 1911.

AND ELECTROTYPER'S AND STEREOTYPER'S REVIEW

The Hours' Crisis: The Scale-raising Opportunity.

AN announcement in *The Daily Herald*, the organ of the London Society of Compositors, which has come into existence with the strike, fluttered the dovecotes of the process world when it saw the light on Tuesday, February 21st. Interested workers, employers and employed, read: "The lithographers—one of the finest bodies of the trade unionists in London—have now cast aside all reserve, and are determined to throw in their lot with the letterpress printers. There are several Societies involved—the Lithographic Artists and Process Workers, the Amalgamated Society of Lithographic Printers, the London Society of Lithographic Printers, and the Lithographic Stone and Plate Repairers' Society." On the following day appeared this correction: "In yesterday's issue of *The Daily Herald* the lithographic artists and process workers were referred to as taking part in the hours' movement and were included as one of the four Societies about to tender notice. We are pleased to be able to report that this Society is not involved in the dispute, Mr. F. C. Tolhurst, the secretary, writing us to the effect that their members are at present working less than the fifty hours demanded."

They are, in fact, working a good deal less in some cases. London hours range from forty-four to forty-eight. As there have been surmises that they might come out in a sympathetic strike, it may be well to make plain that this has not been in contemplation. There would indeed be no consistency in such a course. It is true that the newspaper compositors, who work either forty-six or forty-eight hours in daily paper offices in the Metropolis, have explicitly expressed through their officials their readiness to adopt any course to assist fellow-craftsmen. They have not, however, come out nor been asked to come out, but have remained at work, contributing a very heavy levy (10s. per week per man, in the case of those earning 50s. or over) to the general strike funds. The process artists are not at the moment called upon for other than the general levy which is being made through the Printing Trade Federation, and which is a matter of a few pence. Had it befallen that they were called out, unless the hours desired by the Unions were arranged, there would then have been a special and perhaps heavy levy from those remaining at work.

In the duplicate trade the four hours, fifty-four to fifty, appear to have been

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generally conceded. "We have allowed a half hour for tea," one general manager of a trade foundry explained, talking over matters with us. "This alteration therefore means four hours allowed by us henceforth, less 2½ hours hitherto allowed which we can no longer afford, or an hour and a half net conceded. Our men will probably put the pace on towards the end of the afternoon. Not having tea in the office they will wish to get home sooner. We doubt very much whether it will mean anything material to us on the balance."

We reiterate, with every emphasis in our power, the urging we made last month. This is a great opportunity for the plate-making trades. It must be realised, first and last and all the time, that the possibility of cutting prices unreasonably is largely dependent upon variation in wage payment. When we come to materials and appliances there is very little difference in price, and what difference there is, is naturally not in favour of the small house with its possibly too small capital. The mere fact that London has not known, at any rate of late, long hours in the process trade (apart from overtime, and of course omitting the foundry), is no sufficient reason for refraining from a long pull, a strong pull, and a pull all together, for the establishment of a living wage for all employers.

We may just as well use the jargon of the labour world, for after all we are all wage workers of a kind. This is not a pronouncement that this, that, or the other particular price as now encountered is an absurdity. So specific a statement is matter for careful conclusion around a table, and not too large a table. It is, however, a pronouncement or a reminder of the obvious fact that all is not well in process, and that we now may

". . . . take
Occasion by the hand and make
The bounds of Invoice wider yet."

The Offset Printer and the Process Man.

By Robert Vincent.

A Further Note—Some Practical Pointers—A Special Negative—The Dry Plate—Round Stop—A Bitumen Caution—A Turpentine Doctor—A Good "Fat" Print—Paper to Paper—Transfer Operations—Norwich Film.

A FEW words more with respect to the various means of linking up the businesses of photo-engraving and lithography on the practical working side. This linking up is now certainly taking place, and that as a consequence of the arrival of the offset printing machine. As was stated in the January number of the *Process Engraver's Monthly*, the processes involved are by no means new to the photo-engraver. What, however, is to be noted is that in their adaptation to the needs of the lithographer some of them need modification, so let us look at one or two of them from that point of view, just as a means of starting ourselves on the right lines.

Some of our leading photo-engraving firms are already catering for the uses of the offset machine by supplying intaglio copper plates ready for direct transferring. It seems very elementary to mention it, but the photo-engraving operator is so used to reversing his work that he is not unlikely to supply a negative that will give a reversed print if he is not instructed

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very carefully in the double printing arrangement of the offset printing machine.

The negative itself is an important divergence from the ordinary kind. The screen dot has not to be of the size perforce necessary for the etching process. The middle tones, however, must be crammed as full of detail as is manifest in the original. So a hard negative is banned.

ROBT. VINCENT,
Process Department, Amalgamated Press, Ltd.

Yet withal, the high-lights must go so fine that they may be cut right away, and so print quite clear on the metal.

A negative to be used for printing on zinc, and re-transferring into position on the machine plate, can with advantage be made on a dry-plate, the shadow dots being just as they should be for ordinary printing, but the exposure being such as to render the high-lights so dense as to be unprintable. If exposure is correct, then proper values will be observed throughout.

A round stop is advisable, and a perfect negative should be striven for, that needs no reducing or intensifying. Viewed without a glass this negative should look like a dense, but not hard, continuous tone negative.

Such a negative being secured, one of the best methods of supplying the offset printer with his transfer is to take an albumen print on prepared zinc in the usual way, but up to a certain point only, the divergence from the photo-engraver's rule taking place after the rolling up and developing out. Do not (as for etching a relief block) dust the print with bitumen and burn it in. Such prints have been given to the photo-lithographer, and when he has washed out for rolling up he has not been able properly to get back his image. Naturally he says lurid things of the photo-engraver. After development, gum up well, and treat the print with a doctor—a good simple one being turpentine with as much beeswax added as it will soak up, strained through muslin and a 20 per cent. of bitumen added. Clear away your surrounding film as usual with nitric acid, roll up and etch, and you will have a good fat print suitable for making a great number of transfers from.

If the photo-engraver is called upon to supply paper transfers for offset printing from existing blocks that he has already made, he must not forget that re-transferring from paper to paper is necessary. Suppose, for instance, he had pages that comprised half-tone blocks, line blocks, and type. He could pull these in transfer ink on single-coated transfer paper; the eclipse transfer ink broken down with a very small quantity of good printing ink being an excellent medium. He would then transfer from this on to double-coated transfer paper (some of these papers, by the way, being of the so-called

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"ever damp" variety now being introduced especially for offset transfers), thus getting his second paper transfer reversed.

If supplying a transfer laid down complete on the plate, much care must be taken in having the plate quite clean and sensitive. Well pumice the plate and pass it through an alum bath which contains a little acetic acid, and carefully gum up and dry, and wash out with a doctor. A good one for this purpose is turpentine with crayon parings added, until it will dissolve no more. Strain the liquid and add a small quantity of sensitive bitumen. Then roll up sparingly with a rubber roller; clear the plate with a piece of woollen rag and water, and roll up with a nap roller and dust with talc and resin ready for etching. Then give a weak etch with a 5 per cent. solution of potassium bichromate with a little gum added. Give a final roll up and a good strong etch.

A very valuable transferring medium that has lately come into use is the grained gelatine film, the "Norwich Film," which can be used in quite a number of different ways. It is specially valuable for transferring titles and additions to existing plates, its transparency and ease of manipulation making for simplification of work.

A splendid sample of offset printing, the plates of which were prepared in this or a similar way, is given in an eight-page supplement of the *Printing Art Sample Book* for July 1910, this eight-page section being representative of the work of the Corday & Gross Co., Cleveland, Ohio.

I cannot pretend to be putting anything particularly new before you, but these few notes may be of use in pointing out the direction in which the photo-engraver's work will lie in catering for the needs of the offset printer.

The Photographic Original in Half-tone Work.

By George Brown.

At the best the process worker's life is full of troubles, and perhaps not the least of them is the poor quality of many of the originals from which he is expected to turn out good half-tone blocks. The ordinary photographer, and even some operators in process studios, seen impressed with the idea that almost any kind of a photograph will do for reproductive purposes, and it is all in the day's work that copying has to be done from originals that range from "soot and whitewash" to weak, flat pictures that possess no contrast and present a difficult problem to the operator, who is expected to get his screen negative of a good printing quality.

Of course the great thing in preparing photographs for reproduction is to secure a good negative to begin with. If this can be managed the rest is easy—that is, if a suitable paper is chosen to make the print. The photographer's first aim, therefore, should be to get a good clear negative with fairly strong contrasts and full of detail. Negatives approaching to what were secured by the old wet-plate process perhaps would be nearest the ideal, but how many present-day workers, outside of the process studio, have had the opportunity of seeing what the old-

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time photographer produced with his somewhat cumbrous paraphernalia of heavy and unwieldy apparatus? The pyro-soda developer for negatives is, in practised hands, not to be beaten for quality of results; but very excellent negatives, of good contrast and free from fog, may be obtained by some of the newer developers, such as Rodinal, Ortol, or Azol, and these developers possess the added advantage that they may be used for the production of the prints as well—that is, of course, if bromide or gaslight papers are used. In the writer's opinion it is best always to use isochromatic plates—even for monochrome copying, when they can be used without a screen—as they certainly reproduce the finest details better than the ordinary plate. This statement, of course, may be controverted, but considerable experience has confirmed this view.

The negative being satisfactory, the question arises, What is the best printing process? To this it may be answered that there is probably no best. Each worker has his preference, and in his own way may turn out prints that will be in every way suitable for half-tone reproduction, and of course a good deal depends on what time may be available. In newspaper work, and rush work generally, the quicker methods must be adopted, but where there is time the slower contact printing papers may be used. P.O.P. in some hands gives excellent prints, and when toned to a good purple colour is looked upon by many process workers as preferable to any others; and certainly the paper gives a better result, in most cases, than when the newer self-toning papers are used, the latter losing so much in fixing bath that it is difficult to hit upon the correct depth to which to print. The glossiest of the P.O.P. makes of paper should not be used, as their shiny surfaces often produce reflections that give rise to much trouble to the operator when copying. The so-called "carbon" or "velvet" surfaces are more desirable, and give very fine results indeed. Of course the photographer in working this class of paper must avoid getting the double tones, which are one of the drawbacks of the process.

Owing to the time taken in manipulating the above class of photographic papers it has become a fairly general practice to use bromide or gaslight papers, and their use greatly shortens the time of production. Of these two papers—of which there are many makes on the market—the best results are got on bromide, the range of gradation being greater than that of the gaslight papers, and in the hands of an expert worker it will give results that cannot be surpassed by any other of the photographic printing processes. The paper in general use for process originals is that known as "glossy," but here again the trouble of reflection in copying crops up, and it would be much preferable to use the "velvet," "egg-shell," or "carbon" surfaces, a class of papers that is eminently fitted for the work.

For high-speed work, when prints are wanted quickly, as soon as the negative is fixed it may be well rinsed in a few changes of water and the bromide paper squeegeed on the film side, the exposure made, and the print developed in a few minutes. Some workers interpose a thin sheet of transparent celluloid between the film and the paper, but this is really not necessary, and is apt to cause a fuzziness in the resulting print. If a few minutes' saving of time is desired the fixing of the negative may be dispensed with. When developed, rinse it well under the tap and squeegee the paper on the film, then make the exposure, which of course will take a little longer—probably four times as

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long as if the plate had been fixed, the light having to penetrate the unacted-on silver in the emulsion. The bromide print is developed and fixed in the usual way; but if a rush is on, fixing may be omitted, if when developed the print is flooded for one minute with water one pint, acetic acid one drachm, and then well rinsed. This application destroys the developer in the film, and it may be put on the board wet and copied right away. Of course if the print has to be preserved the fixing must be done as soon as possible after copying, as exposure to the light will deteriorate the print as it dries.

Prints on very rough-surfaced papers often come into the engraver's hands to reproduce, and a more unsuitable material for the purpose could scarcely be imagined. Putting them under glass is unsatisfactory, and often increases the trouble. A large stop is best used for this kind of job, and fairly soft results have been got by placing a couple of thicknesses or so of chiffon (as used for ladies' wear) mounted on a frame about a foot or so in front of the lens. The number of thicknesses to use, and the position, will probably vary with the subject, but this is a dodge worth trying.

Another wrinkle—when copying a dull-surfaced print such as a matt bromide or a platinotype, rub it over with a mixture of equal parts of artists' megilp and terebene, using a pad of soft rag. This will bring out the sunk-in detail in the shadows and give a brilliance to the print that will surprise those who have not tried the dodge before.

Cost of a Minimum Half-tone.

So important is the question of the cost of photo-engraving that a committee of the most able photo-engravers in America was appointed by the I.A.P.E. to consider the introduction of a standard cost system. This committee consists of Messrs. Anderson, of the Consolidated Engraving Co., New York; Blogg, of the Alpha Engraving Co., Baltimore, Md.; Stinson, of Gatchel & Manning, Philadelphia, Pa.; Mears, of the Buckbee-Mears Engraving Co., St. Paul, Minn.; and Blanchard, of the Suffolk Engraving Co., Boston, Mass. Mr. George E. Benedict, of Chicago, Ill., moved the following resolution, which was seconded by Mr. George Meinshausen, of Cincinnati, Ohio, at the Convention of the I.A.P.E.:—

"Whereas the evidence presented by expert accountants at this, the fourteenth annual convention of the International Association of Photo-Engravers, shows beyond question that the cost of making a minimum square half-tone is not less than $2; and

"Whereas we are satisfied that no photo-engraver has an advantage in cost of material, labour, rent, etc., that will make a material reduction in the cost of a minimum square half-tone; we therefore declare that it is the consensus of opinion of the delegates here assembled that there can be no profit in selling minimum square half-tones at $2 each; and further, we are convinced that there is an actual money loss on every minimum square half-tone sold at less than $2 each. Therefore, be it

"*Resolved*, That the evidence presented to this convention be published in the *Secretary's Bulletin*, and a copy of the *Bulletin* sent to every photo-engraving concern in the United States and Canada."

This resolution was carried unanimously.

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The World in Colour: A Visit to the Photochrom Company's New Quarters.

A NOBLE pile of buildings has arisen in the Old Bailey — noble, perhaps less in "elevation," which is that of the average important business block, than in the dimensions, superficial and cubic, of the various "floors." There is, to be sure, a great appeal to the artistic sense, for the long line of fine windows in the rear command delightful views of the quiet Chapter House Square, of the trees which here and there refresh the eye and the mind even in the heart of the City, and particularly of the upper part of the Cathedral of St. Paul and of a number of Wren's graceful church spires. Sunlight, too, floods these casements almost unbelievably in the early mornings. Altogether this new building is well worthy to be, as it has become, the home of so important a house as the Photochrom Company Ltd.

How the great business endured so long to be cribbed, cabin'd and confined in its quarters in Hosier Lane, Smithfield, will always remain a general surprise, and a particular surprise to those who handled its affairs. That, to be sure, is universal experience. The controller of a large, a many ramified business shrinks almost appalled from the prospect of disturbing anything. He conjures up the removal contractor as like Pope's great Anarch who

> "Lets the curtain fall,
> And universal darkness covers all."

When the desperate deed is done, why, then, he sits reflectively in the midst of well-ordered things; he surveys a business for the first time, perhaps, sectionised and compartmented after his own heart and brain, and the marvel to him is that he did not rush into the alteration long before.

Though I do not know enough of Mr. Melville Lambert's mind in the matter to affirm this as a precise presentment in his case, I do affirm that here in its new quarters the business of the Photochrom Company is sectionised, harmonised, and correlated in such manner as was hardly conceivable at Hosier Lane. So here, then, we see the Photochrom Company quartered in a space of 6000 feet superficial (at 7 to 12 Old Bailey, London, E.C.) in a long north to south range of offices in the great block in the Old Bailey, and for the first time having administrative offices in the City at all proportionate to the extent of its world-wide enterprise in all branches of illustrated work and to its manufacturing scale.

I called the other afternoon, and was whisked up in a trice to the new studios, show rooms, and offices.

Let me give a rough idea of their lay-out. The company has taken the whole length of the buildings, with a look-out along the eastern front, from which, as I have said, its workers see the dome and the minarets of St. Paul's shouldering high above the roofs.

Imagine yourself now standing midmost the length of the long line of departmental sections. You are facing east. On your right is the Reception Hall and Artists' Studio, the latter with eastern-looking casements. Also on your right, but nearer the centre, are the General Office, the private room of the Managing Director (Mr. Lambert), and the room of Mr. Isler, one of his right-hand men.

The Order Department has its habitat

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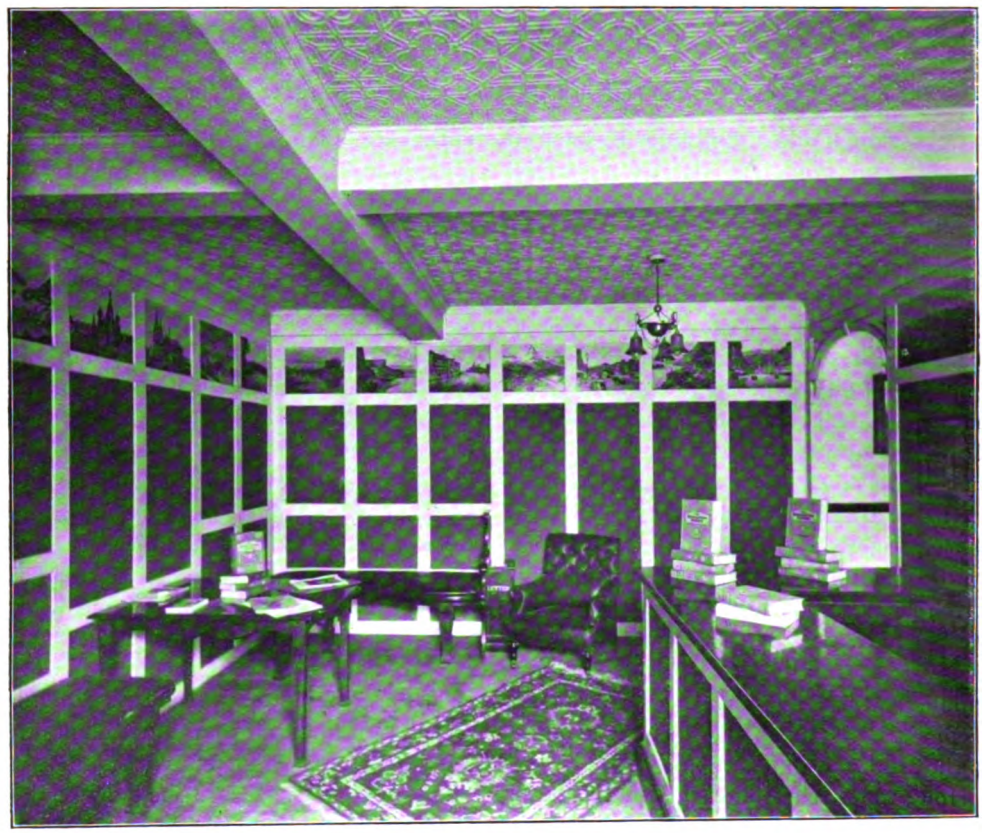

The Entrance Hall and Reception Lounge.

in a section of the general offices. So much for the disposition to the right. To note the office arrangements on the left you first pass through iron doors. There are, indeed, four sets of iron doors down the length, and as each set connects 15-inch thick walls (15-inch as per L.C.C. requirements)—you see what a sacrifice of space the company has had to make.

The Process Department has its locale immediately on the north side of our imagined central standpoint. Close to it, facing the east, is the Correspondence Office, with its staff of stenographers, night and day, and alongside the Correspondence Office is the room of Mr. Watts.

The literary planning and supervision of many things the firm is called upon to undertake make plenty of demand for an editor's service, and Mr. Watts is the Photochrom's editor. He also, having eastern windows, has the good fortune to greet the rising sun morning by morning. (A bit of journalese, perhaps, since the sun in summer gets there first, and very frequently, too, in the winter.) Certainly one would not have this literary worker remove his sanctum to the other side of the passage-way and change places with the store of photochroms, that

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The Artists' Studio.

wonderful collection, massed in row upon row, in orderly arrangement.

The Post Card department adjoins the Photochrom Stock Room. The east front at this point is devoted to the Packing Department. There are two goods lifts at either end of the long block on the eastern side, and two passenger lifts on the other side of the offices. Add to this that two rooms not yet allocated will probably be studios, and you may form a fair idea of the disposition of these City premises.

I am not concerned at this time and place with the company's fine engraving works at Tunbridge Wells; nor with any other of the various works comprehended in its working plant, and located here and there in places far remote over the globe. All that is another story.

And now we have taken stock of the lay-out of the place, I must go over the ground again, to some extent, in passing on my information. I have talked lay-out geographical. I will talk lay-out commercial; of what are the services the Photochrom Company essays to render.

The company started out to sell colour. "I revel in colour," said Ouida; "I perfectly roll in it." To sell colour, then, and with it the love of locality. Surely we all recall the familiar Photochrom

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The Managing Director's Room.

colour views with their distinctive appearance.

Millions of these colour views have been sold. *Pari passu*, the firm's colour post card has been developed: millions of these. The business these things represent is now handled, day in, day out, but other things have been added. There have been constant and large developments of the specific work of photo-engravers. The commercial lay-out to-day is expressed in a thoroughly well equipped process plant in Tunbridge Wells, working in connection with a large strongly manned, many-sided Studio of Design in London. The Process Department at Tunbridge Wells—the Royal Tunbridge Wells, as we are now to designate that town — has been added to repeatedly during the last six years. Its colour department was absolutely doubled in 1909. It received again a very substantial addition in 1910. Quite apart from the process department the company has an immense photographic and general production business at Tunbridge Wells.

This pleasant town is situate within an hour's rail journey of London. It is a delightful place to work in, and as we human beings are all consciously or unconsciously influenced by surroundings,

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The Show Rooms.

the very charm and healthful powers of "the Wells" must tell in some way on the quality of the work there carried on day by day. "I am going away from Hanley by the first train in the morning," George Bernard Shaw has just told an audience in that pottery town; and he rallied them as to why they put up with such ugliness and such a polluted atmosphere. Man made Hanley, but God made the countryside round "the Wells"; the spirit of the countryside, the feeling of its charm, have been instinct in the minds of those who have fashioned that town. You get some benefit of this in the work you order to be there carried through.

I know all this is subtle, but it is not less real on that account. Our most experienced advertisers are fond of discussing the whole elusive problem of "the psychology of advertising." There is a problem of the psychology of Art Production, or, to quote the company's slogan, "Art in Commerce." The company were photographers on a large scale before they were process engravers, and they are photographers on a still larger scale to-day. Their chief photographic quarry, and that over the face of the whole globe, is the fine natural view anywhere and everywhere; but it is also and specifically the fine architectural view—the Kremlin of Moscow, the water-fronting palaces of Venice; views galore of

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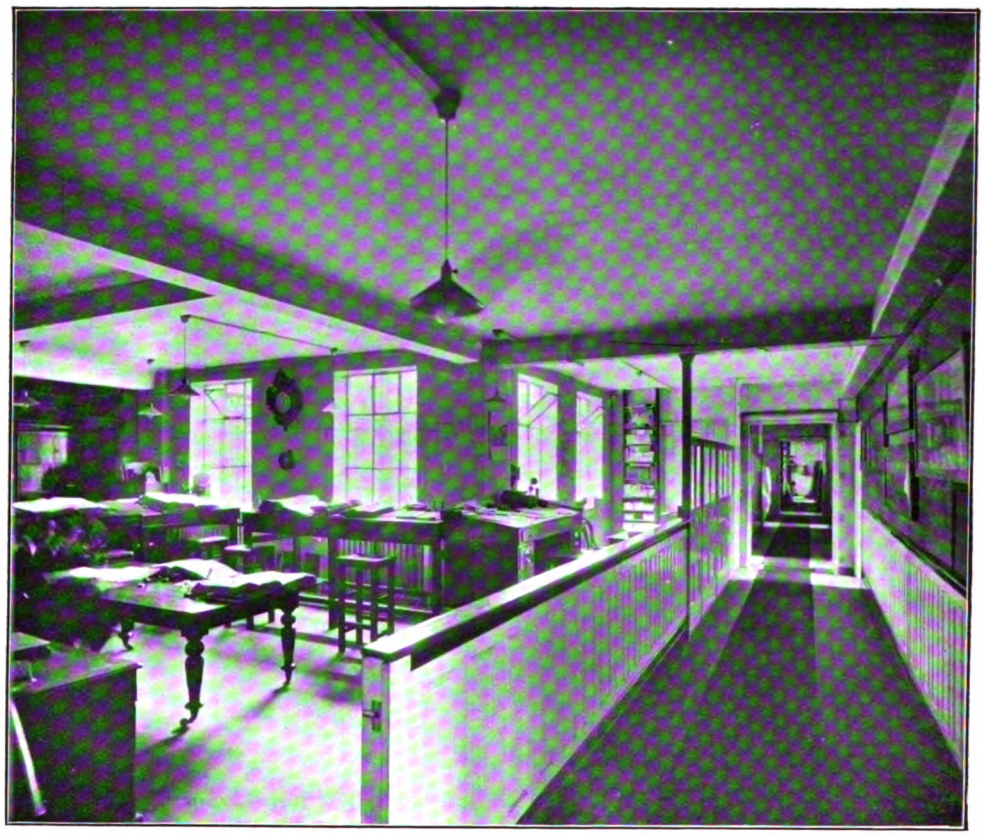

General Office.

such kind—architectural, ecclesiastical, governmental, nondescript—as would be delightful to such eyes as John Ruskin's.

The thought of Ruskin and of his pupil William Morris, "the inspired upholsterer," leads the mind naturally to beautiful work of men's handling, and that remembrance comes fittingly, for I have to note that many noble things of use and ornament are constantly being photographed by this company. Often they are of a large size. In fact, the company have quite extraordinary facilities for photographing very large objects. They photograph many objects direct. But there—the thing for the reader, having a present or reasonably probable business interest, is to call at the new offices in London. Turning a few pages of their great portfolios will soon make him *au courant* with the company's finest work.

As the process engraving works have developed, so, correspondingly, there has been progress in the Studio of Design. That studio is domiciled in the new home at the Old Bailey. Along the line of a well-developed studio of design lay the giving of maximum service to the client, the railway company, the shipping company, the hotel, or whoever or whatever that client might be. A large staff of artists was at work when I passed through the

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studio. Some were preparing transparencies. Upon these transparencies a view such as Scarborough Parade, for instance, is photographically presented. It is stretched upon a suitable box-holder, and electric light can be switched on and the whole brightly illuminated from behind. It sends the mind back to a phrase made familiar in Photochrom announcements.

"If it is anything in illustration," says this Company, "it is in our way."

What the firm likes to do is to carry an illustration job from start to finish. When you plan from the outset, and know exactly what, and whom, you are to aim at, you have then your very best chance to get greatest results at least cost to your client. Incidentally that is the way to be useful to all other sorts of firms as well as to your own. "One man of force makes room for many." The leading printers of the country are included in the Photochrom's customers. Correlation of personal forces is a great part of modern business triumph. Business indeed has long been system and science; and now it is becoming statesmanship as well.

On their slack day, when it comes, some of the chiefs of the firm had better call in the stenographer and work off part of the story of their lives. Mr. Sweetman, for instance, the technical manager at Tunbridge Wells, spent two winters in Arctic latitudes getting photographs of snow scenes.

At another time Mr. Sweetman was taking views around Madeira and the Canary Islands. Operators have been sent to India, and probably will be sent there again when the Coronation Durbar takes place. Though East is East and West is West, at last the twain *do* meet, on these Old Bailey shelves. Holy Land views, too, taken by the Photochrom operators, are here in great profusion.

Mounted posters, cards, letter cards, framed show-cards—these are some things which the many travellers of the company are continually initiating. These "Ambassadors of Commerce," or, in this case, "Ambassadors of Art and Commerce," cover the whole country in their peregrinations. They carry samples to the average weight of three hundredweight.

The 'phones are ringing all day long—there are fifteen intercommunicating telephones. Impossibilities are telephonically and otherwise demanded and performed.

One distinctive acquisition of the Photochrom Company is the Cycloramic Camera. It will produce photographic prints of seven feet length or more. One exposure, one film; direct contact print on one piece of paper. What could be better than this Cyclorama for giving a broadly comprehensive view of some health resort? It may be, too, that some firm, with pardonable vanity, wishes to pleasure itself by photographing a really large-sized group of the whole of its factory operatives, who may number a thousand or two. This camera with its wide sweep makes that possible.

As I leave these handsomely appointed rooms I take a last look at the reception hall, for truly it deserves more than the hurried glance of the visitor just keeping his appointment. I note how it is adorned with a deep frieze of large, varnished, unglazed photochroms in white panels. Wild West American scenery, scenes on the Tiber, the Matterhorn, Innsbruck, with its mighty mountain shutting in the street,—these and a score more views in rich colour adorn the structure, and attest these workers' power.

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Facings and Pacings.

NOTES ON THE DUPLICATING TRADE.

By "Ion."

THE chief interest in regard to the plate-making trades connects up with the hours' dispute. At this moment electrotypers or stereotypers are "out" from the following offices: Messrs. Waterlow & Sons, Ltd.; Waterlow Bros. & Layton; Hazell, Watson & Viney, Ltd.; Spottiswoode & Co., Ltd.; Unwin Bros., Ltd.; J. J. Keliher & Co., Ltd.; the London & Co. Printing Works; Suttley & Silverlock, Ltd.; Sir Joseph Causton & Sons, Ltd.; Page & Pratt, Ltd.; Hampton & Co.; Novello & Co., Ltd.; the Bell Punch Printing Co.; the Britannia Folding Box Co.; the Ivorite Co.; Barclay & Fry, Ltd.; the London Printing Alliance Co., Ltd.; Bean, Webley & Co., Ltd.; and Bradbury, Agnew & Co., Ltd. One of these houses is understood to have dismissed its men before the hours' crisis became acute. It will be seen that no trade house is affected. I use the term as applying to a house depending entirely upon its foundry for its dividends or profits. It will be seen, too, that no process engraver having a foundry is included in this list.

The trade is a highly organised one. Pretty well 90 per cent. of the journeymen of London, to which alone these notes are referring, are included in the trade union.

And now I have to make a mention which will probably carry no little surprise to many readers. It is as to the exceptional degree to which members of the trade unions have bestirred themselves in action, looking towards better selling prices of the finished plates. It is quite true many have considered that it was no part of the journeyman's function to concern himself with any prices, wise or foolish, which might be charged by his employer. Mr. J. Nicol, the secretary of the London branch of the Federated Society of Electrotypers and Stereotypers of Great Britain and Ireland, holds a different view. Twelve or more years ago he proffered specific aid to the trade houses in London, so far as might be compatible with the duties of his office, in their effort, presuming them to be making an effort, to improve the scale. I say "presuming an effort," for such efforts or signs of effort were infrequent, fitful, and feeble. However, there was definite proposition embodied in correspondence between Mr. Holloway, the secretary of the Electrotypers' Association (and general manager of B. Dellagana, Ltd.) and Mr. Nichol. Very little, if anything, resulted from the efforts of about twelve years ago.

Seven to eight years ago this very interesting paragraph appeared upon the notice paper of the London branch. It was due to hold a quarterly and special meeting on October 5th, 1903: "All members are expected to attend, as the business is of extraordinary importance." Item 8 was: "To consider proposition by Mr. Nichol, seconded by Mr. Nott, to amend the Rules of the London Stereotypers' and Electrotypers' Society as follows:—

"Rule 8, strike out and substitute 'Any member, or employer, or other person, having any kind of accusation or complaint against another member, or against an employer or other person, shall make the complaint in writing to the secretary, who shall lay it before the Committee within seven days, or be fined 1s., and either party being dissatisfied with the decisions of the Committee may appeal to a Special Meeting, in accordance with Rule 23.'

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"It shall be a complaint for any employer to allow a larger discount than 5 per cent. from the 'Lowest Scale Prices' except to engravers or zincographers, who may be entitled to 10 per cent. The 'Lowest Scale Prices' are as follows:—

	Mounted.	Unmounted.	Mins. under 6 inches.
Electros from line, type, etc.	1d.	⅞d.	6d.
Electros from half-tones	1½d.	1¼d.	6d.
Stereos	½d.	5-in. 2d.	4d.
Moulds only	Six for 1d.		3d.

"Subject to amendment or modification by the trade.

"Firms allowing larger discounts shall be considered unfair houses in the interests of the trade, and shall be closed to members of the Society and provided for under Rule 35.

"Members of the Society in full regular situations under one employer shall first obtain permission from this Society before working for any other employer, or a penalty of 5s. to 10s. per week (at the discretion of the Committee) shall be inflicted for every week the offence continues, if permission has been refused. Grassing on newspapers exempted, subject to definition.

"In consideration of the Society upholding prices to 'Lowest Scale Prices' the employers agree to pay weekly to the father of the chapel in each shop the sum of 6d. per week for each journeyman, apprentice, and assistant (receiving wages over 12s. per week) that they employ; and from this fund journeymen shall be paid strike allowance, as per Rule 35, and assistants shall be paid £1 per week (provided it is not more than their regular wages) for a period not exceeding thirteen weeks, if called out to maintain prices.

"The employers' weekly contribution to the funds shall not be payable whenever the balance of the fund in hand exceeds £400. This fund is to be placed under the control of a finance committee of an equal number of employers, overseers, and journeymen. When the existing arrangements between employers and employed cease to exist, the whole balance of the fund shall be handed to the Printers' Pension Corporation, to provide a pension for members of the Stereotypers' and Electrotypers' Society.

"That in view of the fact that negotiations are at present pending between the Society and the representatives of the employers, and that a meeting took place between them a few weeks back, at which it was agreed that the employers' representative should draw up a scheme and call a further meeting to submit it, the Committee are of opinion that it is extremely undesirable that such action as suggested in this item be entertained at the present time, and recommend that the question be dropped pending the receipt of further official communications from the employers or their representatives."

The question was dropped accordingly, and there was no man strong enough to revive it under more hopeful circumstances at a later date. The successful movement which was inaugurated four years ago when the 1d. became 1⅛d. was a movement in which the worker's wage had no part as such. However,

"One thing there is denied the very gods,
To make past things as though they had not been."

It will remain the indisputable fact that journeymen in this trade, at any rate, that their representative and trusted spokesman, who is their trusted spokesman still, showed more than willinghood to con-

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tribute as in them lay toward the betterment of the whole craft.

Mr. J. S. Sunderland, long time known to the plate-making world as manager of the photographic and original and duplicate plate-making departments of George Newnes, Ltd., at Floral Street, E.C., is establishing himself as an expert consultant in the plate-making world. His telephone address is "Central" 5166, and business address, 86 Rosebery Avenue, E.C.

There are matters of solutions going wrong, there are many things in which the aid of any one who has had such opportunities as Mr. Sunderland has enjoyed in Messrs. Cassell's and George Newnes' and other foundries may be very helpful indeed. He is an instance of the advantage accruing to young apprentices or young journeymen from making avail of technical classes and competing for examinations of the London City and Guilds or related kind. He won quite a list of honours in that connection twenty or so years ago, and blue ribbons then secured have been followed by a blue ribbon or two in the sense of important appointments. It is not so long since a Parisian daily paper was very glad to have his assistance in the inauguration of a forward movement in its foundry. I believe the mechanicians all christened him "John Bull." We shall be glad to hear of Mr. Sunderland's success in his new enterprise.

System in Screen-negative Making.

By "Sigma."

(Concluded.)

THE screen distance, which on this particular system will remain constant at whatever reduction, may be found by making its ratio to the screen opening the same as that of the camera extension to the effective aperture. To do this multiply the size of a screen opening by the ratio agreed upon. This will give the distance from the actual lines of the screen to the plate. For instance, keeping to the ratio before mentioned, *f*/45, and considering a 150-line screen, each opening in this is a square whose sides are $\frac{1}{300}$ of an inch long. Multiply by forty-five.

The above supposes that only one stop is going to be used in making the exposure, and that the aperture and screen ratios are to be equal. This condition does actually permit of making good screen negatives from average originals, but for other copies some variation must be made at the discretion of the operator, while some "white paper" or "flashing" may be given with smaller stops when deep blacks or browns occur. Then, too, for coarse work, less than eighty lines per inch, the screen distance may require to be uniformly increased somewhat.

Any system such as the above may be worked equally well with square stops of the same area. Then instead of one stop, the more usual two may be employed, one larger and the other smaller than stop as described above, and the allowance for copy made by varying the ratio of the two exposures. Any well-considered system will help the operator to maintain a uniform quality of work, and will relieve him of the mental burden of considering several of the factors which go to form a good screen negative. His mind and attention will be more undistractedly available for the real and distinctive consideration which the particular job in hand involves.

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The Optical Qualities of Colour Filters.

By A. J. Bull, London County Council School of Photo-Engraving and Litho.

THE fact that three-colour work is so steadily upon the increase, not merely for small work, but also for large-sized jobs, renders the question of the optical qualities of the filter an important one. It is most essential that in a large print the register should be good, for the brilliant inks that are used for the printing produce bright coloured lines which catch the eye if the impressions do not fit exactly.

For small work, the usual filters, made by sealing a film of coloured gelatine between two plates of glass, with canada balsam, answer perfectly for three-colour half-tone, provided that the glass has been carefully selected. It is, however, when large work is done, above 12 × 10 inches, that the trouble of want of register near the edges is usually encountered. Such a defect may be due to the lens used, but more commonly it is the filters that are at fault.

When a filter is considered as a plate of glass, then it may cause a disturbance of the image, either due to its purely optical properties as a plate of refracting material, or to its accidental and individual defects, such as imperfect flatness or such as internal strain. Now, experience has shown that it is these latter that are the more important features, under ordinary process conditions. Therefore as the quality and size of the work increases, so also is a greater and greater accuracy being demanded in the construction of the filter. The purely optical effects have been well considered. Placing a filter behind a lens throws the image back by a small amount, depending on its refractive index and thickness. There is a variation of this effect with the angle, which produces a curving of the field, making it concave towards the lens, but this could only become noticeable at wider angles than are usually used in reproduction work. These effects are, however, generally quite masked by the much greater errors due to imperfect flatness, which show up because the light has usually so far to travel after passing through the colour filter.

If the filter were placed immediately in front of the photographic plate, instead of in its usual position close to the lens, then this want of flatness would not matter, but to place a filter close to the plate entails a fresh set of difficulties. It must be as large as the plate, perfectly even in tint, and quite free from bubbles and scratches. When close to the lens, it may produce an alteration in focal length, or very commonly a slight astigmatic effect so that vertical and horizontal lines are not focussed at the same time, or the effect may be so complex that there is no true focus.

Want of perfect homogeneity in the glass will contribute to these defects, although the imperfect flatness appears to be chiefly responsible for producing them.

When filters are made by coating one of the glass plates with the dyed gelatine, there is a risk that the film may exert sufficient pull on the glass to distort it. It is for this reason that the best filters are made by sealing a film of gelatine between the glass plates. The images produced through the three filters must be of exactly the same size. Any variation in this respect is more serious than even a small alteration in the position of the image, because it gives rise to a want of

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register at the edges which manifests itself in objectionable coloured lines, while at the small apertures employed for direct three-colour work small alterations in focus are not noticeable.

There appears, however, at present no other solution for some of the difficulties that have occurred in the more exacting work than the use of glass of high optical qualities for the filters.

Photo-Engraving in the Provinces.

By Harold Hood, F.R.P.S.

(*Concluded.*)

I CONFESS it has been one of the most astonishing things in life to find, at any rate in the photo-engraving trade, what a perfectly useless bait mere lowness of price has proved to be. Hardly any brother photo-engravers in this country can have failed to experience perturbation, nay, consternation, at the flamboyant advertisements of apparently responsible firms as they shrieked at us in the monthlies of a year or two since. The prices quoted were, roughly speaking, less than one-half what one would consider normal.

And yet one is inclined to ask "vere iss dot barty now"? It really doesn't matter whether he is still unfortunately alive, or whether he be not quite decently buried —because, though that type of low-price worker does undoubtedly do mischief, yet I think it must be generally the irresponsible occasional fish who flounder into his net. The stable, regular customer of the photo-engraver, the man really accustomed to handling large quantities of blocks, does not accept or even flirt with the work of every "cheapest and best" megaphone in the advertising pages of trade journals.

Because, after all, the sorts of customers who are really worth having know perfectly well that a very low price quite certainly brings with it something short. The customer for his low price may get a good plate badly mounted; or he may get a bad plate well mounted; or he may get a good plate well mounted and delivered late; or he may get a well-mounted block delivered to time, but so bungled in the interpretation of orders that all the other excellences are as nought. If the customer of the cheap man does get prompt service of good blocks, no one is more surprised than the customer, because he knows quite well it is unnatural to expect it. In all this digression is the easily read moral—that, in order to keep customers splendidly loyal, it is not by any means necessary that your blocks should be cheaper than anyone else's. It *is* necessary that your block prices should be reasonably near the average, and almost unreasonably good in the matter of uniformity. Whether a provincial or not, it is quite useless to expect a well-maintained turnover if indifferent work is habitually allowed to be sent out. A block re-made rather than suffer an imperfect first one to go out is really an extremely cheap form of advertisement —or, rather, it avoids the left-handed advertisement which that first bad block would have proved had it been suffered to pass.

These observations may be said to apply to all photo-engravers, but I am quite

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certain they apply more to provincials than to Londoners or to those engravers in great manufacturing or publishing centres. And why? Do you know that, though it may seem an exaggeration, there is something in the idea that the average printer will put up with an imperfect block from a London house which he would promptly return to his provincial engraver? A large but rapidly diminishing section of printers, and other block users, think that no good thing (in photo-engraving) can come save out of London. A superstition which even the Londoners, themselves of competent judgment, will admit to be ill founded.

In half-tone and colour photo-engraving, as in fine letterpress and colour printing, the provinces have no difficulty whatever in maintaining equal excellence with London. If it comes to that, do not even the London houses do their best work outside of London?

To sum up, then, one must regard the provincial photo-engraver as having the best chances of success if he promptly accepts and faces the limitations necessarily involved in being established far from a great newspaper or magazine publishing centre. Time is of essential importance in that class of trade. The editor in the bigger cities is generally willing to pay a little more per square inch to that firm whose representative can be "round in a minute" in answer to a telephone call.

But the provincial has equal chance with your Londoner in very many other directions than these, and I should say that he was an unobservant man who dared claim that the best worked-up machinery blocks, for instance, came from London. And one could easily mention many another direction in which the chances and opportunities, *and results*, are about equal, to say the least of it.

My object in writing these notes has by no means been to decry London work and to glorify the provincial engraver, but rather to give the latter that reasonably "guid conceit" of himself to which the experience, at any rate of the past few years, shows him to be entitled.

More Offset Publicity.—Messrs. George Mann & Co. Ltd., of Larchfield Works, Hunslet, Leeds, have sent us a calendar which has been produced by offset process, the printers being Messrs. Blades, East & Blades, who were among the first to work offset machines in this country. The white paper selected is naturally dull-surfaced, and is of course on suitable board. It bears three tints of blue, the lightest towards the border. Other tones are black and orange. The name of the firm and the address and telegram and 'phone details are left white, and so naturally is the space (about 6 by 5 inches) for the actual calendar. Centred in the orange panel is a black print of Mann's patent single-colour rotary offset machine. The details are all there. It is quite a successful illustration of the applicability of offset to illustration of machinery. At the same time its general softness (which is really a black upon the grey side) fairly illustrates a point well worth impressing, namely, that there are a great number of instances in which there is nothing really very much gained by emphatic accentuation of every detail. If it is clearly seen, at any rate upon close scrutiny, that may be enough. Emphasis beyond that point may add nothing to illustrative value, while absolutely destroying that softness which is in common the great charm of illustration. The calendar in its advertising panels reminds us of the two-colour and perfecting offsets made by the firm; as to their flat bed offsets, their rotary litho machines, their flat bed litho, their bronzers, their rotary and flat bed tin printing machines, their varnishes, their ink mixers and their guillotines. It is a reminder, too, of their London address, 31 and 32 Kirby Street, Hatton Garden, E.C. Two globes, with the hemispheres crossed by seeming bands, present upon those bands names of cities in which, if we remember rightly, Mann's have won Exhibition honours.

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The "Can" and "Can't" of Offset Printing.

OFFSET printing, if it can be considered for a moment as a sentient thing, may well claim to be delivered from its friends. They claimed too much for it at the first. Some of us entered a protest against this. But the claims "Became no better, fast." We are very glad to notice how Messrs. John Swain & Son have entered the lists and have championed both processes, letterpress and offset, with fine impartiality. *Swain's Quarterly* has a "Leader" signed A. D., behind which initials stands revealed the personality of Mr. A. Dargavel, managing director of the Columbia House, the new Swain's headquarters in Shoe Lane. Mr. Dargarvel anticipates a happy counsel just given by Mr. Asquith, the Prime Minister, "Walk by the light of common sense in the domain of reality." Mr. Dargarvel examines in the light of common-sense certain utterances of two protagonists in the offset and letterpress printing worlds who have been jousting in the pages of *The Inland Printer* of Chicago. One of them, Mr. W. Dickinson, appears to be an enthusiast for offset; as well he may be, since it is a really wonderful new power which has come into printing affairs, quite a new planet that has "swum into our ken." He notes with keen satisfaction how the offset printer can produce bulky, at any rate substantial, catalogues, with good thick paper, and though he may pay per pound for them the same money as for the heavy-coated papers, he will yet receive ever so many more sheets for his sovereign, since the paper suitable for offset commonly weighs much less than paper of corresponding bulk used for letterpress. On his appropriate paper he can give that soft effect which commonly meets "the desire of the eyes"; and though he will probably lose many fine details, he may be only losing something not necessarily wanted by anyone.

We often speak of "not seeing the forest for the trees," and it is possible to miss the ensemble and the pleasing effect of a picture by reason of the undue degree to which its minute details are forced upon attention.

Dull rough-surface papers, or the now familiar matt papers, lend themselves exactly to the production of this much-desired soft effect; and altogether it was a joyful day for the printer when he first realised that offset had come in to free him from bondage, in certain cases, to the maker of the enamel coated "stock." We are one with Mr. Dickinson as to this.

There is, too, another incidental. The postage of a catalogue lighter in weight is lighter in money.

In the actual working of a job it is of immense importance that pictures printed by offset "can be duplicated by means of transferring from the original plate, no electros being required. You simply take the transfers and place them on the sheet in the position required, in just the same way as when placing to stone. On the offset machine the time and cost of make-ready is practically eliminated."

Messrs. Swain make these points, the last of them, in the exact terms cited. And they add a thing which it is very well worth while to note. You must have the right kind of plate to take transfers from. The original half-tone block will not do, for the following reasons: you would reverse the picture. You would have to use transfer ink for rolling up the block, and as this would spread under pressure and become squeezed from the centre of the dots, this would become porous, and the details in shadows would become solid.

Clearly there is a very good case for the offset machine, and it is not wonderful that Messrs. Mann of Leeds (upon one of whose rotaries the example which we insetted last month was printed) should have found so large a market for their machines. Some time ago the number of Mann offset machines in printeries had already run into the hundreds.

Other makers of offset machines have also been doing exceedingly well with them. It has meant quite a boom in the printing engineering, and Great Britain, which practically means England, seems to have had a fair share of the business.

It is not surprising that the disputation as to offset between the two spokesmen of America should have been as keen as we have seen it. Business is full of lively episodes, of challenges and acceptances. Mr. Dickinson, the offset vindicator in this instance, suggests that there was something less than perfect fairness in the presentation of illustrations by the two methods in a recent number of *The Inland Printer*. The idea was to show side by side the markedly contrasted results obtainable by letterpress half-tone and by offset. Says Mr. Dickinson: "I have scrutinised these insets very carefully, and find that the greatest care was used in the make-ready and printing of the half-tones on the

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flat-bed press. The stock used was radium enamel paper, which is one of the best grades of enamel stock. An extremely high-class half-tone ink was used. The offset sample produced from transfers from these same half-tones was printed on cheap laid stock. The difference in the price of the paper alone is evidence of the unfairness of the illustration. An extremely poor transfer was secured from the originals": he thinking the blocks had had several thousand impressions run off before the transfers were taken at all. To which Messrs. Swain attach the natural comment that to take transfers from half-tone blocks is not the way to obtain best results on offsets. That method is, or ought to be, obsolete.

The champion for the half-tone letterpress argues that rough paper is no more artistic than smooth. *Per se* it may not be, but it is a question of the fitness of the proprieties of the medium.

Glazed paper is fitted for half-tone work ordinarily. It has, however, a serious detraction from it that there is generally an unpleasant reflected light, and it is never really reposeful to the eye. It scarcely ever softens the picture in the desired degree.

For ourselves we hail with pleasure all the satisfactory appearances of half-tone upon matt, rich, soft, dull-finished paper. Messrs. Swain apparently go further than we are quite prepared to do, when they say that enamelled surface papers are the correct medium for printing of half-tone blocks on letterpress machines. We would amend by the words "at present" or "in general." For given absolute fitness in the inks and suitability in the subject, we think that dull-finished paper may be just as correct. All these are proper matters for consideration by the alert engraver, and we shall be glad to hear views of our readers thereupon.

THE GOVERNMENT CONTRACT FOR PROCESS BLOCKS.—The Thames Engraving Company has again recovered the Stationery Office contract for the next five years. Although the price at which the work is undertaken is an exceedingly low one, a strong effort is to be made to make it profitable. To this end the company has installed a complete equipment of up-to-date labour-saving machinery, and the managing director has thought out many ingenious devices for economising both time and material.

My Causerie.

SCHOOL culture, like agriculture, occasionally can boast a fine aftermath. An instance which is capable of being classed under that head has just come to my notice; or more strictly speaking, a second, a later instance. A few years ago the Principal of Bolt Court School impressed upon Dr. Mees that there ought to be some real good to be done to the trade and to himself as *entrepreneur*, if he could devise new photographic plates. I believe I am right in saying that Dr. Mees was not at first quite so sanguine as to this. I am not suggesting that he had not looked into the thing before, but if so, he was by no means an optimist in the matter. However, he acted on the suggestion, and he builded wiselier than at first he knew. He established what is now the very important addition to the Wratten & Wainwright business —the manufacture of special sensitive colour plates.

So far so good, but now for the sequel. Messrs. Hunters, Ltd., have for some years been selling these fine plates. As an accompaniment they have been selling Wratten filters. Unfortunately there has been another, a more unhappy, accompaniment—half-tone printers have been bewailing all over the country that they could not get good results with the inks supplied. Accordingly, that problem has now also been tackled. And, as will be seen elsewhere in this journal, Messrs. Hunters, Ltd., are now putting on the market inks complementary to the Wratten filters; the blue-green ink reflecting a much larger amount of green than is commonly reflected, and consequently giving a much purer green on the finished print. All the green required has to be reflected by the blue-green ink, as well as by the yellow. And all the blue-violet must be reflected by the magenta as well as by the green-blue. Messrs. Hunter, in drawing attention by circular to these inks, say that from the fact of their being manufactured for users of Wratten plates and filters, together with the improvement in colour, the greater permanency and fuller body (which will make the inks go further in use), these inks will be gladly welcomed by the trade. I commend the news of these multiple services to the trade—this aftermath or by-crop resulting from the good seed and good culture of the L.C.C. School—to the notice of gentlemen who are ever ready to say that none of our schools are practical.

Some men seem to be obsessed with the idea that if a man ever gives a lecture in a technical

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school he must be a man thoroughly unpractical, purely theoretical, all-in-the-air. Perhaps the champion instance of a lecturer stepping down from his rostrum and simply putting all the practical men to the right-about was afforded by Stonewall Jackson, that quiet, unassuming lecturer at a military college in the United States, whose exploits when the civil war broke out in the sixties were to set the whole world ringing with his prowess.

Some years ago I was invited by the London Stereotypers' and Electrotypers' Association to attend their annual high tea function. I remember that a delightful feature was the mimicry and recitals of a Mr. Littlejohn. He was then connected with the firm of James Dellagana & Co. I presume this is the same Mr. Littlejohn who has just published *Hokey-Pokey* and *Warbles and Whims*. Sir Henry Irving was obviously greatly impressed by one poem in particular, a blank verse with the dread-revealing title "Mad," appearing in one of Mr. Littlejohn's works. "I hope," he said, "I may some day have an opportunity of attempting to do it justice. I think it admirably suited to delivery."

Where—where—where is our Platemakers' Club? It did run well; what did hinder it that it did not succeed? There is a great amount of talent in our ranks. It isn't good business to neglect it. Perhaps some of our trade troubles would settle themselves if we let them alone while we had a good time together.

Mr. Johnston many of us know as a globe-trotter and facile linguist, and in general an accomplished man of business. And here he is dropping into poetry, like Silas Wegg. Witness the Shakespearean paraphrase on the cover page of our February issue. Mr. Johnston is not the man to run away from responsibility even if he could declare and even prove that he was not in this case the guilty party. He must shoulder the responsibility and get out of it as best he can when the late Mr. William Shakespeare and he run up against each other in another place. I hope one or other of the many facilities embodied in the Miller saw trimmer and pointedly emphasised by the parodist has appealed to the business mind here, there and yonder, and led to correspondence of the kind to lead to business. The Miller saw trimmer seems to me the 'cutest, cleverest thing I have struck for many a long day.

I have been turning over the pages of the *Klimsch Year Book 1911*, obtainable, I presume, through Messrs. Hunters, Ltd., Poppin's Court, E.C., and of course from Frankfort in Germany. There are various printing points, but I will confine attention here to matters appropriate to an engraving journal.

A delightful feature is the manner in which the line illustrations in their character and their strength are in perfect keeping with the type. The colour pages are not interspersed throughout the book at haphazard, but are collected at the end. They naturally figure upon different "stocks," different kinds of paper. The book proper is a compilation, first to last (that is, until the commencement of these supplementary colour sheets), of one kind of type on one kind of paper.

There is an article on rotary printing, and another embodying information as to regulations and arrangements directed to preventing accidents in workshops in our crafts. There is a German association of employers in the printing trades formed for this precise purpose, and with a long name setting forth its object.

Newspaper photogravure is touched upon; it is our old friend the Mertens process again. And I am sorry to say that the illustration of rotary photogravure bound up in the book is also only that copy of the *Freiburg Zeitung* with which we are already familiar in this country.

I see an example of a sixty-degrees screen which it is claimed is superior to other screens for newspaper work. The superiority, however, is not very manifest in the particular subject shown. An article on the Gutenberg Museum at Mainz is worth noting, and there is a fine reproduction of the oldest Gutenberg print, one executed in 1445.

In a versatile profusion of good wares I see information touching the rotoplate, a matter of special interest to the stereotyper. A semi-automatic pouring machine is described. The problem of the best water-cooling has evidently been exercising German minds.

What is called chalk lithography is illustrated, the sort of thing we call grainwork. And there is much talk regarding transfers, transfers from stone to stone, transfers from grained plates, multiple transfers, negative transfers, transposed transfers, reversed transfers, transfers on to zinc and aluminium, photographic transfers with some guidance as to simultaneous positive and negative printing, transfers from type, transfers from typewriting, transfers to grained paper drawings, transfers from gelatine tracings, and transfers from so-called stone paper, anastatic transfers, and transfers for zinc for relief etching, transfers from embossing plates and from woven patterns or materials, and photo-lithographic transfers in general.

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The most striking calendar I have seen this year is the one brought out by John Swain & Sons, Ltd., of Columbia House, 89-90 Shoe Lane, Fleet Street, E.C., and of Barnet. It is 20 × 14½ inches khaki card, suspended by a red silk cord. I dare not risk my ignorance of mediæval costume, but it seems to me that the subject is an old-time soldier at the Vatican. He wears the shoes of, I think, the fifteenth or sixteenth century. His costume is of red, slashed in the doublet and breeches. The stockings, too, are red, and he has light tan shoes. The staff of the halbert and certain parts of the curtain present something of a purple, and give an acceptable relief. He stands against a light marble pediment of a pillar.

Regarded as a product of three-colour halftone it is very remarkable, very powerful. For the rest, the lettering in Vandyke brown and claret and a sort of olive brown is in every way worthy of the firm. The statement of Swain's branches at the foot of the calendar will astonish some recipients. Who would be ready to affirm offhand that Swain's has branches, in addition to the great house in London, at Barnet in Middlesex, at Birmingham and Manchester in the English provinces, at Glasgow in Scotland, and at Paris on the Continent? F. COLEBROOK.

Index of Current Literature.

Klimsch's Year Book, volume xi., presents a great wealth of literary matter relative to our various trades and sectional industries. Various mentions of its contents are made under the heading "Causerie" in this month's issue. The book is published by Klimsch & Co. in Frankfort, and is obtainable through Messrs. Hunters, Ltd., of Poppin's Court, E.C.

The Lithographic Artist's and Process Engraver's Quarterly for January has an article on a visit to German printing centres by Arthur Ellis Jones, and another on the eight-hours day (editorial). Mr. A. J. Newton concludes his contribution on "The Evolution of Photo-mechanical Illustration." Mr. Thomas R. Way's "Exhibition of Lithography" is fully discussed by "C. H.," which initials we presume we may identify as Charles Harrap, and are glad to greet his well-known and illuminating pen.

Penrose's Annual (*The Process Year Book*) needs no particularisation in this index, and indeed if we were to attempt this the task would require a column. We have dealt with it, and it is a joint of the cut-and-come-again variety. We give here simply the reminder to any who have omitted so far to buy it.

Le Procédé for January deals with colour printing by use of shading mediums, on which Mons. Chappang discourses. Mons. Clerc deals with a frequent failure in trichromatic synthesis, viz. the excess of red. On page 14 there are references to cement immune from attack by acids. *Le Procédé* also has an article upon line blocks worked with addition of colour-tint blocks. The heading is "La Chromotypogravure par décalque."

The British Journal of Photography of February 17th deals with a "System in the Studio" as a secret of success, and gives a good deal of information regarding "Soar's method of making relief and intaglio printing plates."

Swain's Quarterly, No. 23, deals with arguments for and against offset work. It balances considerations, and helpfully indicates what can and cannot be fairly claimed by offset.

In *The American Printer* of February, H. A. Gatchell treats of getting away from commonplace in engraving. A writer shows how "Ben Day" mediums should be laid. A non-technical but very timely dissertation is that by D. W. Gregory, under the heading, "The Printer's League Point of View," The Printer's League being a comparatively new organisation in America exercising in general the function of mutual introduction and conciliation.

In *Zeitschrift für Reproduktionstechnik* for February, published by W. Knapp of Halle, Saxony, there is a learned and copiously illustrated article dealing with colour curves; illustrating particularly diversions or interruptions of those curves.

The Graphic Arts for February, published by the Boston National Arts Publishing Company, New England Buildings, 200 Somers Street, Boston, U.S. (25 cents), is notable for a colour photograph of the Rapids above Niagara Falls; the method being use of direct colour-separation negatives. Another illustration shows combination of out-of-door colour photography by one company with the plate-making and printing of another company, the subject being a motor car with some woodland background. A third

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picture depicts a handsome room interior with various wall-hangings, carpets, mat, chair, cabinet, etc., in colour direct from the objects.

The *Graphische Revue* deals with the problems of book printing.

Pocket-books for Process Workers are produced both by Messrs. Hunters, Ltd., of Poppin's Court, E.C., and Messrs. A. W. Penrose, Ltd., 119 Farringdon Road, E.C.

The British Printer for January 1911 publishes its "Plate-making Causerie," which urges incidentally that the hours' controversy may be turned to good account for price raising. It makes mention of a new American rotary photogravure process.

"White Letter on Black Ground" is discussed on page 327 of *The British Printer*, January 1911, with illustrations.

The Inland Printer of February 1911 has articles on "Modern Methods in Ink Buying," by Arthur K. Taylor; on "Scientific Colour in Practical Printing," by E. C. Andrews, who discusses this time "The Colour Solid as a Basis for Colour Combinations"; on "Bichrome Poisoning Once More" (we note that Mr. J. Gaskin's remedy as mentioned in Penrose's *Pictorial Annual* is referred to approvingly); on "Horizontal and Vertical Etching"; on "Repairing Damaged Half-tones"; and on "Three-colour Printing," by C. E. Happerfield. This last reproduces an address delivered at the December meeting of the Glasgow and District Centre of the Printers' Managers' and Overseers' Association, and it is interesting to note that the report as it appeared in *The British and Colonial Printer* is here reproduced with full and courteous acknowledgment. There is also an illustrated report of the dinner to the "Photo-Engravers of the East," under the auspices of the Photo-Engravers' League of New York.

THE ILLUSTRATION POINT in a recent number of the *English Illustrated Magazine* is the relief which may be afforded in a magazine whose bulk of pictures are to be ordinary half-tones, if the simple expedient is adopted of first printing a wide tint and then printing certain well chosen half-tones over the tint. The tint in this case is eggshell blue. The drawings which have this tint background and surround are very various in kind, but are all well selected for the purpose, and are equally enriched by the double printing.

Patents.

11,527, 1910. SAALBURG. PROCESS FOR THE PRODUCTION OF MULTICOLOUR PHOTOGRAVURE.

Process for the production of multicolour pictures by intaglio printing surfaces, characterised in that a single sheet of "carbon" tissue, which, when developed, furnishes the transfer resist, is exposed under all the individual positives at a single time so as to ensure that the conditions under which there are performed the operations such as sensitising, developing, etc., incidental to all the prints, shall be identically the same for each print.

28,448, 1909. A. NIXON, EAGLE WORKS, DURHAM GROVE, HACKNEY. COPYBOARDS FOR PHOTO-MECHANICAL REPRODUCTION APPARATUS.

Object = improvements in copyboards which, together with the means for attaching the copy thereto hereinafter referred to, overcome the difficulties hitherto experienced and present advantages of a useful and labour-saving nature. Copyboard is formed of a substance (other than wood) which will remain in a flat condition notwithstanding the variation of temperature and atmospheric conditions, and which is impervious or can be rendered impervious to air.

28,345, 1909. WAITE, AND WAITE & SAVILLE, LTD. MEANS FOR CHECKING THE IMPRESSION AND INKING AND DAMPING MECHANISM OF ROTARY LITHOGRAPHIC PRINTING MACHINES.

Object is to provide the impression cylinder with an automatic foot-operated mechanism by which the checking of the impression can be instantly performed by the operator without moving from the feed position; and further, to so couple up the ink and water contact rollers as to enable them to be automatically checked from coming in contact with the trough rollers once for each time the cylinder impression is checked, and also to provide for running up or distribution, which it is preferable to do with the impression checked, so that either or both ink and water supplies can be in action while the impression is checked.

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Rotary Photogravure: Patent Granted to Mr. Saalburg.

MR. SAALBURG has been granted a British patent, No. 22,776, for his method of rotary photogravure, as follows:—

"I, Charles William Saalburg, of 188 West Fourth Street, New York city, New York, U.S.A., photogravure printer, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

"The object of my invention is the production of a picture by a method which offers new facilities in printing, especially from a cylindrical surface; these new facilities ensuring a fuller rendering of a wide range or depth of tone in the print, so as to produce a more pictorial effect.

"To this end the invention consists in an improved method for producing a photogravure printing surface of the kind which is broken up into partitioned areas of uniform size but of varying depth by successively printing a diapositive of the picture and a pattern screen on the etching resist. In carrying out this method according to my invention I obtain the partitioned areas by means of a line screen as hereinafter described, and I use a transfer resist.

"The printing surface produced according to my invention possesses relatively large and clearly cut cavities of varying depth, which are bounded by well-defined and relatively narrow substantial walls or dykes having their tops all on the same surface level, and which are adapted for being filled with a soft printing ink; offering special facility for striking off the excess, even in the cold, and allowing of impression on dry paper.

"In the making of a picture by my said process I first make a negative direct from the picture or object to be reproduced. I next make a positive transparency from this negative, and preferably do any necessary retouching upon the positive. So far no printing screens or other devices for breaking up the surface into printing divisions have been used. Next, ordinary commercial 'carbon' tissue is sensitised in the usual manner by a bichromate solution as used by the carbon printer and squeegeed for drying on a smooth surface, such as a glass plate, from which, when dry, it is stripped, as in the ordinary practice of carbon printing. I preferably cut the tissue so that the length of the tissue in the strip runs the long way of the positive.

"After the 'carbon' tissue is sensitised, it is exposed under a screen by which are obtained on the tissue relatively large unexposed uniform areas bounded by straight hardened lines, and on the photographic image being impressed, development of the 'carbon' tissue on the metal plate or cylinder will give on etching well defined or substantial walls or dykes bounding clearly-cut cavities of varying depth. For the purpose of obtaining such unexposed uniform areas bounded by straight hardened lines I use a single line screen such as can be made by black varnishing a sheet of glass and taking a diamond and running white lines, about 135 to the inch, through the black varnish.

"The 'carbon' tissue is exposed under the screen for preferably one quarter of the time which it will require under the positives After the tissue has been exposed under the screen with the lines running in one direction, the screen is turned at right angles to print lines running in a corresponding direction, and the tissue is again exposed for a similar time as before.

"This crossing of the single-line screen may be at first sight regarded as resembling that method of using the screen which is often practised in making special negatives for block production; but in the case of my invention the aim and use are different, as I produce a carbon print or resist for transference to, and development upon, metal by hot water.

"After the screen lines have been printed on the carbon tissue, as above indicated, the tissue is exposed under the positive.

"After exposure under the positive, the exposed 'carbon' tissue is squeegeed on to a carefully cleaned flat or cylindrical metal surface and the backing stripped off, leaving the gelatine film of the 'carbon' tissue adhering to the metal surface. If this is cylindrical, care is to be taken to position the tissue so that the horizontal axis of the picture is exactly parallel to the axis of the cylinder.

"The exposed portions of the 'carbon' film have had their gelatine rendered insoluble by the action of the light, while the remaining portions of the gelatine are soluble. By the application of warm water the soluble gelatine is washed off, leaving the negative of the picture on the metal surface in gelatine. The plate or cylinder, after covering the portions of the cylinder which it is

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necessary to protect from the etching fluid with asphaltum, is now ready for etching. The plate or cylinder is now etched in the usual manner in which photogravure plates are etched, and the positive of the picture is thus sunk into the plate or cylinder, but is by the screen lines divided up into rectangular cells. These cells are of varying depths according as they are under the high-light or shadows or intermediate tones of the picture. My method thus depends on not using any absolute or bituminous or resinous resist, of the kind dusted on the bare metal plate in operating the 'Klic' process. It is this characteristic, combined with the special and novel mode of producing the etching resist, which differentiates my method from other methods more or less based on the 'Klic' process.

"Of course, if the etching action were permitted to continue long enough, the etching agent would strike through and etch the screen lines and the high-lights. It is by stopping the etching action at the right point to preserve the screen lines and high-lights, while giving time enough to etch the darker portions, that the proper effect is obtained. The film is not hardened to produce a 'resist.' The cells preferably cover a much larger portion of the area of the cylinder than do the screen lines. The gelatine is then removed from the plate or cylinder, and the plate or cylinder is ready for printing.

"The cylinder is placed in a rotary printing press. In printing the picture, ink is applied to the plate or cylinder in a sufficient quantity to fill all the cells between the screen lines. The ink is then wiped off in the case of a plate, or, in the case of a cylinder, scraped off preferably by the revolution of the cylinder against a sharp steel blade, which fits closely against the cylinder, and which is preferably moved back and forth across the face of the cylinder in a direction parallel to the axis of the cylinder, the length of the blade running parallel to the said axis.

"The scraper or 'doctor' removes the ink from the cylindrical surface of the cylinder wherever such surface remains, namely, from all the screen lines and from all the blank portions of the cylinder which are to represent white in the picture and the white margin around the cylinder, and this operation leaves the cells or pockets between the screen lines completely filled with ink.

. . . . . .

"As it is exceedingly difficult to perfectly clean a cylinder surface outside of the picture where it is desired to have the paper in its natural condition, and without having any ink on it, I adopt the expedient of arranging an elevated first plastic, then resilient surface on the impression cylinder exactly corresponding to the picture, so that during printing the paper shall not be pressed against those portions of the printing cylinder which have not been etched, thereby preventing any set-off of colour from such non-engraved portions of the cylinder.

"The mode adopted of providing this elevated surface on the impression cylinder is as follows:—

"A number, usually five or six, of pieces of manilla or other strong paper is taken and cut to the proper size. The cylinder is then cleaned with a light solution of lye or other solvent of fatty matter. The pieces of paper are then coated with strong glue and adhesively fastened on to the cylinder, one on the other. To maintain the printing height and keep the action even, each end of the impression cylinder is preferably provided with a bearing in the form of a ring or band projecting above the surface of the impression cylinder at substantially the same height as the said elevated surface. This ring or band may be of paper or the like, or metal. When metal rings or bands are used each of these may advantageously be made in two or three pieces, and be arranged to be secured to an end of the impression cylinder by countersunk screws, this arrangement allowing of adjustment being made by placing one or more layers of paper under the bands to vary the height if necessary.

"After the elevated surface has thus been provided on the impression cylinder, pressure is put on the press and the press started running. The bearing bands at the ends of the impression cylinder keep the pressure just right, and the wet glued paper layers are pressed down to the exact thickness of the bands.

"When the elevated paper surface is partly dry, the printing cylinder is inked up, and the press revolved once to print an impression on the elevated surface. Now all those portions of the elevated surface outside of the picture, as the margin, where it is desired to leave the paper clean upon which the picture is to be printed, are cut away. In this manner an elevated surface is left on the impression cylinder exactly corresponding to the picture, but not extending beyond it, and, in fact, depressing or removing the remaining portions of the impression cylinder surface. In this manner, when the printing takes place, the paper on which the picture is to be printed is not pressed against the portions of the surface of the printing cylinder which are not engraved, and thus any slight film of ink which

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may remain there is not transferred to the paper.

"It is better to have the elevated surface composed of a plurality of superimposed layers of paper than to employ a single thick layer, as the former arrangement is found to have a longer life than the latter.

"The impression cylinder is twice the diameter of the printing cylinder, so that the printing cylinder can have two revolutions between each printing operation. By the use of the said arrangement of cylinders and the said ink, I find that a single colour can be printed upon a dry sheet of paper of dull or matte surface at a high rate of speed, so that many hundreds of such impressions can be made in a single day. It is not necessary to dampen the paper nor to heat the cylinder, and it is not necessary to rub the cylinder off by hand or with a cloth as heretofore. The 'doctor' does not injure the surface of the cylinder, and the cylinder thus has a very long life.

"The difference between the picture produced by my printing surface and that by a half-tone intaglio printing surface will be more or less apparent, but I may state that in the latter case the ink is of the same density and the tones produced by varying size of dots, whereas with my printing surface the various tones of the picture are produced by different depths of ink varying from transparency to opacity.

"My invention is not to be confused with gelatine relief methods of preparing a printing surface, as for rapid-power printing, where a doctor or scraper is used, the granulated deposit of the metal, which is a characteristic of all electro-deposited objects, would leave, when scraped, a slight tint of ink giving a granulated effect on the picture. Thus I exclude from my patent any broad or general claim to the impression of a screen upon a sensitised gelatine surface, separately from the printing of an image thereon, for the purpose of obtaining a grained relief preparatory to making an intaglio printing surface therefrom by electro-deposition. Also I lay no claim generally or broadly to successively impressing a sensitised metal surface with a screen and a diapositive with a view to breaking up the printing surface into partitioned areas, and neither do I claim generally or broadly the use of a carbon transfer resist; but, having now particularly described and ascertained the nature of my said invention, and in what manner the same is to be performed, I declare that what I claim is:—

"1. Process of producing an intaglio printing surface, which consists in subjecting a sensitive 'carbon' tissue to the action of light through a line screen of the kind and in the manner described, thereby giving uniform unexposed areas bounded by well-defined hardened lines, printing from a positive reproduction of the picture on to the 'carbon' tissue, transferring the tissue on to a metal surface, developing the image on the metal surface, and finally etching the metal surface so treated, whereby relatively large and clearly cut colour-receiving cavities of uniform area and varying depth, and bounded by substantial walls or dykes having their tops all on the same surface level, are obtained, substantially as herein described.

"2. The use of an intaglio printing surface produced under the process claimed in Claim 1 hereof, for printing therefrom, while cold, on dry paper with thin ink substantially as herein described.

"3. The improvements in the preparation of photomechanical printing surfaces and the production of prints as hereinbefore described. . . .

"Dated this 6th day of October 1910, HYDE & HEIDE, 3 Broad Street Buildings, Liverpool Street, London, E.C., Patent Agents for the Applicant."

School Notes.

It is an interesting sign of the times that the London County Council takes half a page advertisement of its school and photo-engraving in *The Lithographic Artists' and Process Workers' Quarterly*, a trade union publication. The advertisement sets forth that "in order that a workman may improve his position, or even maintain it, he must be efficient. This school enables anyone engaged in photo-process work, lithographic drawing, or design for book illustration, to perfect himself in his own department, to handle the most up-to-date appliances, and to learn something of the principles underlying his work. If a workman feels he has mastered his own branch, he can obtain some knowledge of the work of allied departments which will make his own work of greater interest, and possibly enable him the more readily to fill another position should the necessity arise."

It is interesting to note that some students from Birmingham come to reside in London

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and take short courses at the London County Council School. We hope the advertisement in this journal may lead others to do the like.

MR. EMERY WALKER has presented the L.C.C. School of Photo-Engraving with a fine photogravure portrait of Mr. William Morris, and also some splendid chromolithographic designs, reproductions from old illuminated manuscripts.

"THE AMERICAN PRINTER" of February 1911 presents, on pages 701 and 748, an illustration of the work of W. K. Patrick, a cartoonist who, the editor considers, "conveys the impression of excellence," and "undoubtedly possesses no mean talent." He certainly can draw a good figure. Mr. Patrick was in England some time ago representing the Hoke Company. While here he was a regular attendant at the London County Council's School of Engraving. A school of design is associated with this engraving school, as our readers probably know, but perhaps may as well be reminded.

THE Leeds Central Technical School had a red-letter day when the students' re-union took place. The rendezvous was the Great Northern Hotel. Features were an address by Dr. Kenneth Mees (who, as an enthusiastic correspondent tells us, was a most delightful and entertaining guest and gave a lecture which will be long remembered), and the inevitable dinner. The menu was a fine piece of print upon imitation parchment, a most appropriate design being discovered in a St. Christopher print in the John Rylands Library at Manchester. The central figure was St. Gregory holding an open book, its pages bearing illustrations. At the foot was the motto, "The lyf so short . . . the craft so long to lern." Admirable feeling and perfect sense of fitness are attested by this design; quite a thing to treasure. The toasts included "Photography and the Printing Crafts," Mr. R. E. Barnett, B.Sc., proposing, and Mr. R. B. Fishenden responding. Mr. S. E. Bottomley, F.R.P.S., proposed "Our Guest," and Dr. Mees replied. Mr. L. C. Mennell proposed "The Ladies," and Mr. Alexander Hazelip did the gallant in response. "The President" was proposed by Mr. Blakely. The School was cheered, not simply by this feast of reason and other things, but also by the prospect of a good term; with a conversazione leading off on March 1st and with a trip to Holland as a students' excursion by way of Easter outing. There is a hope of visiting the Dutch State Printing Works at The Hague, and perhaps also the Senefelder Printing Company of Amsterdam.

Brevities.

A GUN-METAL-MOUNTED lens brought out by Messrs. Hunters, Ltd., of Poppin's Court, E.C., is one of the most interesting features of the moment's developments in process. We would advise our readers to make themselves acquainted with all particulars of this new product, to which we hope to make fuller reference.

NEW AIR BRUSH APPARATUS.—We have examined a new apparatus brought out by Mr. A. Aufholz, who is in business as a worker in pneumatic decorating apparatus and exhaust appliances. He has devised an auxiliary air-controlling bench cylinder for the use of artists. Illustrations he issues convey a helpful idea of the usefulness of this very neat and compact appliance. One notes an air cylinder (size 7 × 7 in.), a reducing valve, a regulating screw, a high-pressure gauge, a low-pressure gauge, a nipple, inlet connecting piece (from main air drum), and a delivery cock, supplying the air brush. Some advantages claimed for this new apparatus are that it can be used on the artists' table, and completely controlled from there. It measures 12 inches from base to top of pressure gauges. Any desired stipple can be obtained in a moment, by turning the regulator to left or right. The low-pressure gauge registers exactly the pressure of air required for coarse or fine work. The high-pressure gauge indicates the air pressure of the main supply, from whatever source supplied, such as compressors running monotype machines, etc.

It will also be well worth while to note the advantages of the new lever air compressor. The operator can be seated and work the pump quite comfortably; or the lever can be reversed so that it is in a position to work the pump when the operator is standing. The compressor has a stroke of 7 inches; bore 2½ inches. The receiver is 24 × 10 inches. A high pressure is very easily and quickly obtained with this machine, and when pumped up it will keep the table apparatus supplied for a considerable time before needing replenishing.

The price of the complete outfit, we believe, is ten guineas, this complete outfit consisting of auxiliary air cylinder (the table apparatus) and the handpiece and compressor as illustrated.

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Estab. Jan. 1894.
"The Process Photogram."

THE PROCESS ENGRAVER'S MONTHLY

Vol. XVIII. No. 208.
APRIL 1911.

AND ELECTROTYPER'S AND STEREOTYPER'S REVIEW

March Events and some Suggestions.

If we may be flippant for once, we will say that March has been the march of events in the process and related arts. Touching these latter first, the month's outstanding incident has been the handing in of lithographers' notices. That action must have acted and interacted to some extent upon the engravers' business, and the end of that influence is not yet. The Lithographic Artists' and Process Workers' Society has remained outside the strike vortex.

Two important firms have moved to larger premises during the month. The Anglo-Engraving Co., Ltd., have taken possession of a fine block at Milford Lane, off the Strand, in London, just west of Temple Bar. This removal has taken them to the near neighbourhood of one of our leading journals, and apparently has led to a report that some personality in the publishing world had been or was about to become one of the proprietors of the Anglo-Engraving Company. It would not have been a hanging matter had it been so. But engravers so self-reliant and so successful as its directors have been through their fourteen eventful years are naturally disinclined to see wrongful attribution of the just credit of achievement. They have embodied in public pronouncement a statement that the directors are the sole shareholders, and that no printers or newspaper proprietors have any proprietary interest in the "Anglo" concern.

Messrs. Hunters, Ltd., so long identified with Poppin's Court, off Fleet Street, E.C., have taken possession this month of their new premises in 16 and 18 St. Bride Street, E.C. Very complete show-rooms have there been fitted up with engraving plant for original and duplicate plate-making, litho and letterpress machinery being also housed in these new and much more convenient quarters. We heartily congratulate this enterprising house on the success thus attested.

Now to pass to a technical matter. The month under review has to its credit that something like justice has at last been done to the engraver in regard to one long misunderstood cause of trouble. We refer to the informing and suggestive article which Mr. Fred Seeley, the manager of Messrs. Kronheim, Ltd., has contributed to our columns, following upon many careful observations and experiments. When register has been faulty the engraver has generally come in for first honours in the matter of denunciation. The printer has no doubt been in the semi-final. But

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there is a third possibility when it is a matter of the just award of blame; and here comes in Mr. Seeley with his useful conclusions regarding paper. He demonstrated the unequal stretch of paper; that along the web direction its stretch under pressure on the machine is comparatively slight, but that across the cylinder the stretch upon the machine is very great. It obviously follows that if a double royal sheet made so as to "feed in" the right way, in regard to this stretching, is cut into two royal sheets, each royal sheet is exactly wrong in regard to its stretch and endangers register or makes it hopeless. Mr. Seeley has long been well known in the art world for his practical work in Baxtertype, and it was painful experience during such work, of the impossibility in certain cases of obtaining register, which set his mind upon these serious experiments.

From America comes information of the Coloroll printing press and process, a notable feature of which is the Expansion Core. This is a process very nearly allied to ordinary engraving as we chiefly know it, though having its special field in wall-paper, calico fabrics, and various textile printing Our readers know very well how intimate and how profitable have been the relationships between printing upon paper and printing upon other substances—domestic substances we may generically describe them—carried on by a great northern business. Apart from this instance there have been other adaptations of an art more generally regarded as the paper printer's, to fabrics unconnected with the publishing world altogether.

Another trend of the late month has been the revived use of collotype. Here we cannot expect our readers to wax enthusiastic. At the same time, if the acquirement of a modest fortune is to be abetted more readily by adding gelatine printing to metal printing than by reliance on metal alone, we apprehend there will be no quarrelling with the most profitable course. In any case, our editorial duty is to report the indications and trends of the time. Our climate's humidity, so commonly avowed as the reason for the non-success in any large terms of British collotype, can hardly embody the last word in explanation; for Amsterdam, whatever else it is, is certainly not the driest city in the world.

A last suggestion emergent during the month has been as to whether photo-engravers are sufficiently alive to the business to be done in the advertising world in the matter of metal labels, as permanent advertisements or permanent notifications.

This subject has been mooted in the *British Journal of Photography*, and though the mention has been slight, the hint, transferred, with grace of due acknowledgment, to our pages, will doubtless suffice for some uptaking engraver in London or the provinces, or in both. Considering the speed and depth of machine-etching, it would certainly seem that there was here a power in permanent advertisement not yet exploited. It sets one thinking of the old niello of the Florentine artificers, who cut letters or ornaments in metal and filled the grooves with suitable dark substance, securing pleasant contrast and high durability.

Altogether, the craft is, we imagine, going forward in this spring and early summer with heartsomeness congenial to the season, and a subconscious or, we will hope, quite a conscious resolve, to effect its own coronation with the crown of a too long deferred and a rich reward.

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("The Process Photogram.") April 1911

Paper Stretching: The Results of some Experiments.

By Fred W. Seeley (of Messrs. Kronheim & Co.).

[When half-tone plates are printed out of register it is commonly the process engraver who gets the first and the chief blame. It is considered quite safe to go for him in any case. If there is to be any alternative, it is merely the blaming of the printer. Finding fault with him is almost equally correct and comfortable. There is, however, always a third course open. The defect may be due to the paper-maker, or at any rate to the paper. This aspect of the matter has presented itself forcibly to Mr. Seeley, the well-known manager of the important firm of Messrs. Kronheim & Co., of Tottenham Hale in North London. Mr. Seeley has been much before the public at different times as the finest exponent of the art of George Baxter of the mid-Victorian Baxtertypes. We are glad to greet him in a new rôle. His conclusions, based upon independent experiments, are here presented. He emphasises particularly that it is courting trouble for the paper-maker to supply paper for fine printing with the web of the paper across the cylinder.—ED.]

SHIFTING AND MAKE-SHIFTING—PLATES "TO SUIT MOST OF THE SHEETS"—FOURTEEN PAPERS TESTED—THE METHOD—THE RESULTS—WHERE MOST STRETCH TAKES PLACE—THE HOPELESSNESS OF MIXED CUTS—REGISTER IN DAMP WORK.

PROBABLY nothing gives so much trouble and anxiety to the colour printer as register. Any information bearing upon this matter will possibly assist in his efforts to overcome this difficulty. There is little doubt our variable climate has more to do with the creation of register trouble than any other cause. Could we ensure a uniform degree of humidity in our atmosphere the "stretch of paper" would be little heard of. It is not so much a question of temperature; it is the amount of moisture in the atmosphere which affects paper, so far as stretch is concerned.

The letterpress printer is not troubled about register anything like so much as the lithographic printer.

In the first case it is often possible to shift the plates on a board, or shift the type in a forme, into register to suit a run of paper, but it is not possible to shift the work on a stone or metal plate once it has been made up; and to make up stones or plates to suit the variations often found in the run of colour work is impracticable. Hence all the printer can hope for is a fit to suit the majority of the sheets. But this is a very unsatisfactory state of affairs.

The printer is often blamed for bad printing through causes beyond his control, when the fault lies at times with the paper-maker. It is possible the paper-maker may be ignorant of the trouble he is giving the printer. Let us hope so.

With the object of showing how much paper stretches when damp, and how much more it stretches across the web than along the web, I have made the following experiments.

It is not possible to choose samples

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which can be classed as "standard papers," but Messrs. Spalding & Hodge have kindly supplied the fourteen different classes of paper experimented with, and these can be taken as excellent samples of their class. A sufficient number of sheets in each class were tested to ensure a reliable average, and where possible a fairly accurate description of the composition of the paper is indicated.

Each sheet of paper was cut to a size exactly twelve inches square. They were then placed between saturated sheets of blotting-paper and stacked for twenty-four hours under light pressure. Each sheet was then measured across and along its surface, when the results as shown in the table were obtained. The sheets were then dried by placing each one upon dry blotting-paper in racks and allowed to remain for some days; they were again measured and the dimensions tabulated. It is possible the significance of the stretch will be more readily appreciated in the alternate columns giving the amount of stretch as a decimal of $\frac{1}{32}$ of an inch, and it must be borne in mind this variation takes place in a small sheet of twelve inches square and would increase in proportion.

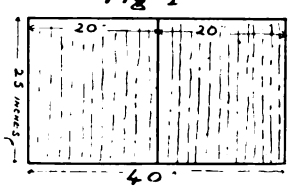
The Stretch more Across than Along the Web.

From my figures it will be seen how all classes of paper stretch with moisture more across the web than along it—that is to say, the fibre opens out and stretches more than it lengthens. And what has taken place with an excessive amount of moisture takes place in proportion with a lesser amount.

When paper is being printed, the squeeze, to a large extent, lies in the direction round the cylinder and not across. That being the case, it is most important that the web of the paper shall be in the direction of "round the cylinder," because we have found by the experiments that less stretch takes place in the direction of the web than across it. If the web of the paper is in the direction *across* the cylinder the squeeze in printing will further aggravate the trouble.

This is the fact I wish to bring home to the paper-maker. It is courting trouble to supply paper cut the wrong way. In all cases the direction of the web should be along the narrowest way of the sheet, because it is the narrowest way which goes round the cylinder. In 20 × 30 paper, for instance, the direction of the web should be along the 20-inch way; in 30 × 40 it should be along the 30-inch way, and so on. Paper-makers must understand that while a sheet, say, of double royal, being made correctly, gives every satisfaction, it will not produce two sheets of royal which are satisfactory in the same sense. The direction of greatest stretching quality is now the

Fig 1



direction round the cylinder; and just where the paper is weakest, its weakness is now aggravated by pressure (fig. 1).

This is bad enough; but what excuse can be made for the paper-maker who mixes paper so that the direction in the working of one job is both ways? I am afraid this is a somewhat common practice, but it is one which should be absolutely condemned. For instance, a 70-inch reel should not be cut in part 30 × 40 and part 40 × 30 (fig. 2).

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TABLE EMBODYING RESULTS OF MR. SEELEY'S PAPER STRETCH EXPERIMENTS.

Description of Paper.	Amount of Stretch shown in decimals of an inch.		Stretch shown in decimals of $\frac{1}{32}$ of an inch.		Re-drying shrinkage to less or stretch to more than 12 inches calculated in decimals of $\frac{1}{32}$ inch.	
	Along the Web.	Across the Web.	Along the Web.	Across the Web.	Along the Web.	Across the Web.
1. Litho printing double crown 60 lb. at 2½d. lb. Sulphite and grass.	·04375	·265625	1·4	8·5	– 1 0	0
2. Plate paper royal 60 lb. at 6d. lb. Linen rag, slightly loaded.	·028125	·234375	·9	7 5	– 2 0	– 1·0
3. Antique laid double crown 24 lb. at 2¾ lb. Esparto grass.	·03125	·140625	1·0	4·5	– 1·0	– ·2
4. Antique laid double crown 45 lb. at 5½d. lb. Rag, with a mixture of loading only.	·015625	·11875	·5	3·8	– 1·0	+ ·5
5. Cream wove plan double crown 25 lb. at 3¾d. lb. Rag (unloaded).	·028125	·28125	·9	9·0	– 1·2	– 2 0
6. Superfine litho royal 48 lb. at 2⅝d. lb. Esparto grass.	0	·125	·0	4·0	– 2·0	– 1·5
7. M.G. litho double crown 23 lb. at 2¼d. lb. Sulphite, free from mechanical wood or loading.	·025	·109375	·8	3·5	– 2·0	– ·5
8. M.G. litho poster double crown 40 lb. at 2½d. lb. Sulphite, free from mechanical or loading.	·03125	·0625	1·0	2·0	– 1·2	– 1·5
9. M.F. printing double crown 33 lb. at 2d. lb. A good deal of mechanical wood and loading.	0 625	·328125	2·0	10·5	– 2·5	– 3 0
10. Plate paper royal 70 lbs. at 7½d. lb. Rag (linen).	0	·125	0	4·0	– 2·0	– 1·4
11. Good printing royal 48 lb. at 2⅝d. lb Esparto grass paper.	·015625	·21875	·5	7·0	– 2·5	– 2·0
12. Antique laid double crown 50 lb. at 2½d. lb. Esparto grass paper.	·015625	·0625	·5	2·0	– 1·5	– 1·0
13. Antique laid double crown 50 lb. at 2d. lb. Mechanical wood about 80 per cent.	·046875	·125	1·5	4·0	– 1·2	– ·5
14. Collotype imperial 80 lb. at 4d. lb. Esparto and rag.	·00625	·109375	·2	3·5	– 1·5	– 1·5

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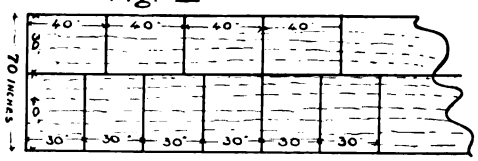
The paper-maker does this to prevent waste, but 30 × 40 should be cut from an 80-inch or 120-inch reel, not a 70 or 90. In the latter case the direction of the web will be wrong (fig. 3). In the former mixed directions will take place (fig. 2). To test

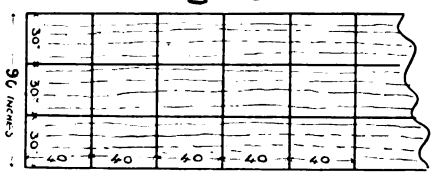
Fig. II



this, if you have a suspicion the paper is mixed, take sheets of the paper and off corresponding edges of each sheet cut a strip about 6 inches by ½ inch. Hold the ends between your finger and thumb, and allow the strips to bend over; if the paper is not mixed each piece will bend pretty well alike, but if mixed some will stand out stiff and others droop, showing that the stiffer strips have been cut off the sheet in the direction of the web and the others across the web.

The same test, to show which is the direction of the web, can be made by first marking with a pencil a line along one edge of the sheet of paper, then cut two

Fig. III



strips 6 × ½ inch off the pencil edge and its right angle edge. Place one strip on top of the other and hold the ends between the finger and thumb; the strip which stands out stiffer than the other is the one cut the way of the web, whilst the other strip is across the web. Noting which strip has the pencil mark will easily tell you the web direction of the paper.

Although paper is not generally used in a damp state it is often so used for collotype, intaglio printing, and emboss work. And if for register work, woe betide the printer who cuts his paper out of a sheet various ways, or who receives paper from the mill cut off the reel both ways. He will never register the sheets when they are dry. Perhaps some bitter experience with this trouble in emboss work and in Baxter colour printing has suggested my writing this article and pointing out the difficulties likely to arise.

The result of the experiments shown in the table will provide thought for other questions besides the particular one I have dealt with, but it is not my intention to deal with any other phase in this article. Such questions as the weight of paper, the composition of paper, the addition of loading, etc., as bearing upon the amount of stretch, readily occur to mind, but they do not affect the general question of proportion of stretch the two ways of the sheet.

It is interesting to notice the figures showing the amount of shrinkage when the paper becomes dry. It is difficult to guarantee that the measurements were taken when the paper contained exactly the same amount of moisture as in the period before they were damped. For this reason it is possible some slight modification of the figures tabulated should be made, although every care was taken to ensure careful analysis. All the samples except two dried to less than the original size. Probably the paper now bulks a trifle more.

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Interdependence in Process: How Plates, Papers, Pressures and Pigments affect each Other.

By Harry A. Maddox, Paper-making Silver Medallist 1909.

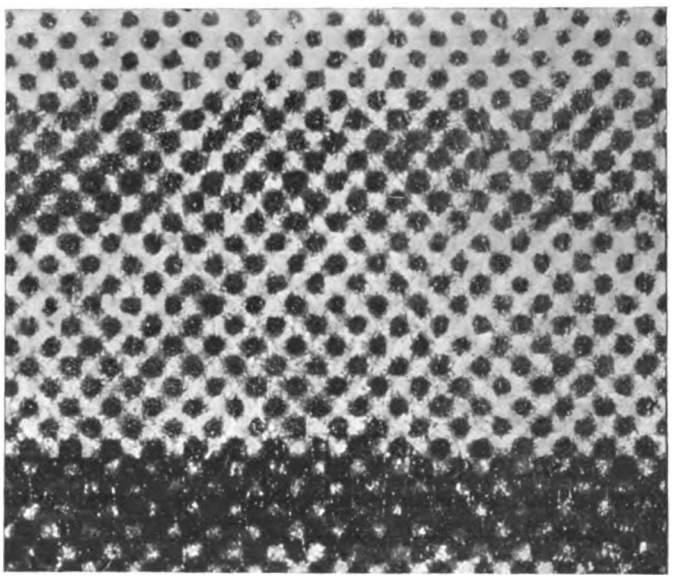
CLAY-COATED PAPER STILL BEST FOR BEST WORK—FOUR FACTORS—THE RATIONALES OF ETCHING—OF INK DRYING—OF DOUBLE-TONE—OF OFFSET—WEAKNESS AND STRENGTH OF OFFSET.

THE dominating force in present-day illustrated printing is undoubtedly the half-tone process block, the actual application of which is effected by very many differing methods. The introduction of the process created a development in paper-making, doubtless in some aspects of a deleterious nature, but essential to the progress of illustrative printing.

Prior to 1882, in which year Meisenbach patented his half-tone process, the surface of any paper consisted of a network of fibres, unadulterated except by inherent impurity. With such paper the value and effect of tone as aimed at in the production of screen process plates was neutralised by the presence of interstices and projecting fibres. Therefore, to accommodate the reproductive process, fast gaining in popularity, coated stock or art paper was introduced, since which it has been continually subjected to severe criticism. The fault can in no way be attributed to the process engraver, to whom the whole community is indebted for the wonderful progress and development in matters of illustration. The fact remains even now, despite the advent of the offset press and its expectations, that to attain the highest results in half-tone printing by letter-press methods, clay-coated paper is essential.

Although the varieties and grades of blocks constitute mostly a matter of quality alone, the actual application of them to printing may be manipulated and designed to obtain a vast number of different effects.

The shade, quality, and texture of paper;
The methods of overlay, underlay, or interlay of the block;
The choice of ink, and the mode of printing,



Microgram (35 diameters) of dots of half-tone as printed by double-tone inks on super-calendered paper.

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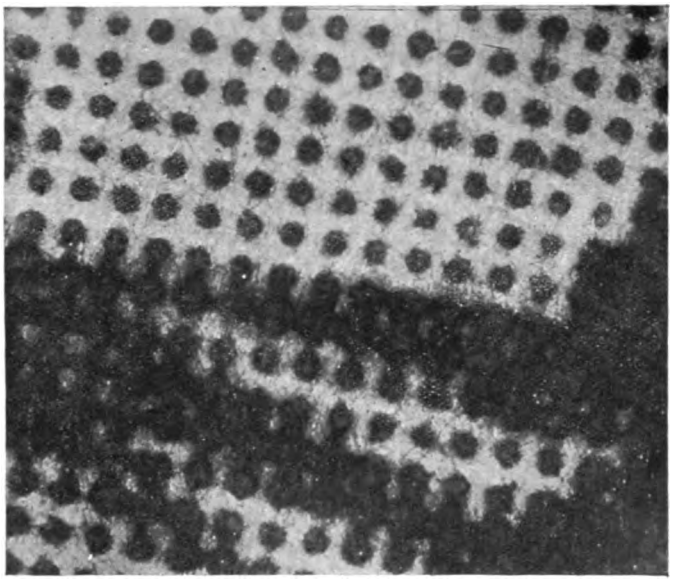

Microgram (100 diameters) of dots of half-tone as printed by double-tone inks on super-calendered paper.

are factors which determine the ultimate appearance of the finished work. No matter what combination the block will afterwards be required to constitute a part of, unless the engraver has produced a good block, no amount of care by the printer will compensate for the inferior workmanship of the engraver.

The Rationale of Etching.

A good half-tone plate should be deeply etched to counteract the possibility of speedy wear and filling up between the dots. Bad etching results in ragged outlines to dots, which minimise the correctness of tone value. In the hands of the printer the dots may be still further distorted according to the character of the ink and packing, with the result that the ultimate reproduction is far from a true representation of the original.

To consider more closely the interpretation by the printer's methods of the dots composing a half-tone picture. Several factors as we have seen influence the result. These are—the block itself, the paper, the ink, and the method of making-ready. If the block be of good quality, the dots composing the various tones are of well-defined outline, not broken or distorted; consequently a perfect impression from the block should so represent the dots. The nearest approach to perfection is attained by the engraver's proof puller with high-grade coated stock and full-bodied stiff ink of the best quality, combined with a slow handpress method of pulling. No tendency towards plucking is likely to be encountered under such conditions, the removal of the pulled impression being a matter entirely and absolutely to be performed according to the intention of the prover.

On the other hand, the printer is tied down to certain fixed conditions. The quality of his stock varies from a badly-coated job line to the finest calcium sulphate and gelatine surface, which latter is about as good as we can get. The class of order decides the price of paper, and incidentally determines to a large extent the quality of reproduction.

The Ink Pull.

The use of stiff ink is denied the machineman owing to the speed at which double-revolution machines will run. At 1000–2500 sheets per hour the block pulls away from the paper at a high rate of speed, during which a minimum of tension must be exerted between the block and

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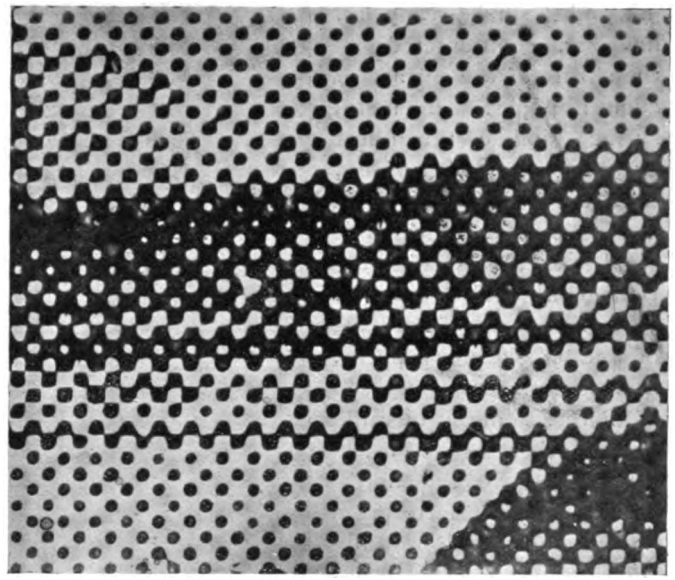
the paper coating. Therefore to maintain the speed and accommodate the nature of the paper surface, an easily workable ink is essential. There is a tendency also amongst machinemen to make free over-use of agents which will reduce the ink and render it more smooth in working, with the result that it becomes cloggy or sloppy--just in a state conducive to filling up the block. The make-ready should be hard, without the slightest sign of bagginess, looseness, or softness, but here again many printers have peculiar ideas of their own as to what constitutes a correct make-ready. Their conception of a hard paper is very often, to say the least, faulty. Smooth papers, whether thick or thin, are not essentially hard papers; in fact, this class, so far as make-ready is concerned, should be narrowed down to limits of real manillas and sulphite-glazed banks or high quality rolled greaseproofs.



Microgram (35 diameters) of dots of half-tone as printed by double-tone inks on real art paper.

Various Influences on Dots.

Take now the influence of all the aforementioned agents upon the ultimate dots of a half-tone. A hard, full-bodied, stiff ink is impossible, for it would pluck and peel the paper. If this were not so, half-tone pictures would be full of life and vigour, supposing the amount of ink to be rightly regulated. A soft ink, apart from the danger of filling up, distributes too full a film upon the projections of the plate. The contact then takes place on to the paper, under the rolling and receding pressure of the cylinder against a hard packing and with firm impact. The result is that the centre of the dot, as impressed upon the sheet, assumes a grey appearance, whilst the film of ink is squeezed to the edges. How far this affects the general result may be determined by an examination of the pull by the engraver, performed under infinitely better conditions. If the make-ready of the printer is on the soft side, the result is very inferior, for the repeated contact under the necessary impression forms a bed, probably in an infinitesimal degree but still sufficient to blur the outline of the dots considerably, taking all the life out of the result. With the use of a non-coated paper the stiffer ink would be permissible, although even here the hardness of the ink is limited by the speed at which distribution and rolling may be effected. Necessarily a hard, full-bodied ink requires a slower distribution to ensure an even film being deposited upon the plate.

All the virtues of the block itself, the

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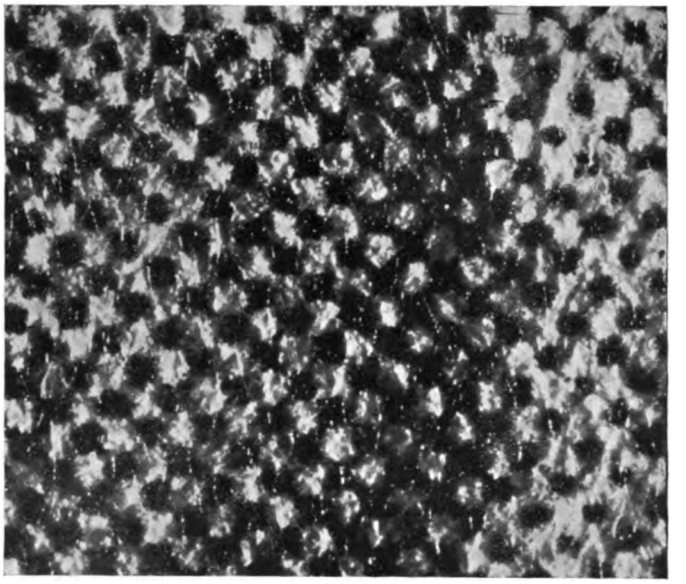
ink, and the make-ready are, however, counteracted by the nature of the surface of such a paper. The metal surface, unlike the offset press rubber blanket, is not the least bit resilient; it is hard and rigid, and will not yield to the fibrous obstructions of an ordinary paper. However smooth the surface of the stock may appear, it is nevertheless composed of fibres, some projecting above others, with interstices betwixt the fibres. The dots of a letterpress half-tone print are not fully represented upon such a surface, for fibres intervene and break the impression, or interstices fail to complete a dot. Thus a broken effect is produced and the picture falls dull and lifeless.



Microgram (35 diameters) of dots of half-tone as printed by offset press upon rough-surfaced bond paper. (Note the fibrous structure of the surface, notwithstanding which, adequate value is given to the dots.)

The Rationale of Drying.

Non-coated differs from coated stock in the nature or character of the absorbency of ink. Whereas the mineral clay of art paper aids to a process of drying by downward absorption and atmospheric oxidation combined, the fibrous composition of a resin-sized, highly rolled paper such as would be the nearest approach to a plane surface, would depend more upon outward oxidation, whilst any absorption taking place would be irregular, owing to the tubular structure of the fibres. Of course the drying would be considerably aided if a large amount of loading were added to the pulp, in which case a poor imitation of coated stock would be produced, in fact a super-calendered or imitation art.

Another important advantage of coated paper consists in the way in which light is reflected by the plane surface of the sheet, giving vigour and brightness to the print. This, combined with the ideal drying properties, probably constitutes the finest argument for art paper, for the level and whiteness of the surface are hardly likely ever to be equalled by an unadulterated paper.

It is sufficiently evident that for the present, so far as letterpress printing is concerned, the highest effects are attained upon well-coated stock. The objectionable glossy surface, which has been considerably commented upon in very adverse manner, has now received a superior competitor in the arrival of matt finish or velvety art paper. This variety creates splendid effects and does not tire the eyes in the same way that the reflective surface of ordinary art paper does.

(To be concluded.)

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An Hour at the King's Printing House Foundry.

THE origin of this foundry is "wropt in mystery." No heralds blew trumpets at its birth. The important decision to instal a duplicate plate-making plant would indeed seem to have been taken in a light-hearted moment. "Hullo, here's a church; let's get married," is the way one swain broached and carried through the great affair of matrimony, according to story. "Hullo, here's a printing world wanting good plates; let's supply them," Messrs. Eyre & Spottiswoode would seem to have said. And forthwith they translate words into deed; and heigh presto! the King's Printing House Foundry.

This short account is, like all other things human, partly good and partly bad. It is true enough that the King's Printers were not thinking of serving all and sundry in the character of platemakers. But it is also true that they had a definite, though a more restricted objective. They were responsible each week for the production of the *Sphere*, and afterwards of the *Tatler*. The plates were worrying them; they produced utterings, not loud but deep—a weird music of the *Sphere*. There were only two things to be done. One might write a general invective letter to the trade papers deploring the faults of everything and everybody, or one might say nothing but do something. That was the more royal way, and that was the way of the King's Printing House. As it did not get *Sphere* plates made of the right

Some Foundry Scenes.

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quality, and in right time, it proceeded to make those plates itself.

Then, to be sure, a new planet-idea one day swam into its ken. "Why keep a good thing to ourselves?" So work for outsiders was undertaken; again with no noise about it. There are plenty of others who essay to bring down various Jerichos by walking round about them and blowing their own trumpets. This foundry "laid low and said nuffin'" but "Received with thanks." That little end of the month utterance soon became a great volume of sound as the trade turnover swelled. Indeed, the business grew so fast that four or five times in their ten years of foundry experience Messrs. Eyre & Spottiswoode

Wax Tables.

have had to enlarge their foundry quarters. They have more than double the floor space with which they started.

For the benefit of those to whom electrotypers' invoices are more familiar than are the details of the process, I will record a few observations of a walk through the foundry. The initiated must not mind a few elemental mentions, necessary to the completeness of the story.

A customer's forme of type is first, of course, cleaned, and carefully examined to see that the type is on its feet, and that there are no soft spots, spots where the matter is not perfectly justified; to see, too, that the type-high clumps are all right. It is polished with plumbago if the moulding is to be by ozokerite (the familiar beeswax is not used in these works). The moulding may be by lead sheets, for this office, and this office alone in this kingdom, has installed lead-moulding plant. If it is to be lead moulding, there is no need for any such plumbago film. You don't paint the tiger lily, and you don't add metal to metal.

One objectionable practice in ordinary electrotyping, but here discarded, is what is called the "floating" of the forme of type with plaster. The purpose is to raise by a plaster addition the height of the most sunken pieces of metal or other components of the forme. If these are raised, the beeswax or ozokerite used in moulding has not to penetrate so far down; and preventing this over-penetration means much trouble saved to the electrotyper. "Let the galled"—printer—"wince," as he, with difficulty, separates and cleans his plastered types; the electrotyper's "withers are unwrung." In America, higher spaces are used to obviate the need for such levelling by plaster; here this foundry has not that help. None the less it gave plaster floating the go-by, setting thereby an example to the whole electrotyping trade of this country.

The King's Printing House has, indeed, addressed itself to furnishing printers all along with the same facilities as were established, and were continually added to, for its own purposes. It has, indeed, anticipated printers' requirements; it has been buyer and seller too; for the trade in general has not known just what improvements in electrotyping have been available till these have been brought to its cognisance.

But we must stick to our inspection

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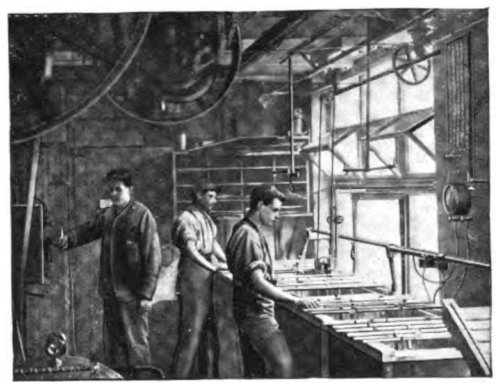
report, like plaster (when used) sticks to your type. We are now introduced to the wax pots and wax tables, and to Difference No. 2. The tables at this foundry are unlike the ordinary wax apparatus in certain important particulars, especially relating to the heating and cooling. "Flats" or so-called "boxes," *i.e.* level surfaces of ozokerite, are very quickly made at this table. These boxes are not at first absolutely flat, because the shrinkage in cooling is unequal; so when "flats" or "boxes" have been cut out, they are passed through a shaving machine to make them uniform in height, though, if wanted, varying thicknesses can be brought about for various kinds of jobs.

The wax flats duly prepared are put into a steam-warmed cabinet to keep them at just the right temperature for immediate service.

This wax apparatus replaces the simple, old-fashioned, slow-going, small-output copper wax kettle over a gas jet. To this day that kettle is the general reliance, but reversion to it here would mean a pretty kettle of fish.

The moulding expresses Difference No. 3. In ordinary practice, a press with about 200 tons power serves very well for most purposes. To be sure, this house has long had a press of 400 tons capacity. Now, however, it has advanced to a 600-tons press. Three-colour, large half-tones, and blocks for poster work demand this greater power.

The moulded "flat," or "negative," so to say, is passed under a machine which cuts down uniformly any needless high mounds of wax. If left, the resulting plate would be too thick, the extra mass of copper adding awfully to cost and to delay, and nothing to effectiveness in printing. It may well be, indeed, that even a very thick plate has quite a thin deposit just where it is wanted most, on the face of the type. I may say that at the Bank of England electrotyping department a tremendously deep shell used to be grown. Or was it in some Government Department? They make electros at the Ordnance Office. I won't make affidavit. These are days of £12,000 libel damages. But the rumour may be worth mentioning to attach to it that in my opinion there is little to be gained for average requirements by depositing a shell of greater than, say, one-hundredth of an inch in thickness. It depends on the moulding and the finishing whether you have a good or a faulty plate.



In the Battery Room.

A film of copper is precipitated on the face of the graphited mould to make a more perfectly conductive surface, so that when the mould is hung in the tank the deposit shall be quickly made on all parts of the mould. It is a law of electrotyping that to that which hath—which hath already a metal facing of a sort—shall be given, and quickly.

When the mould has been trimmed down, the machine has done this work effectively, uniformly, quite without discrimination. Now comes in the discrimi-

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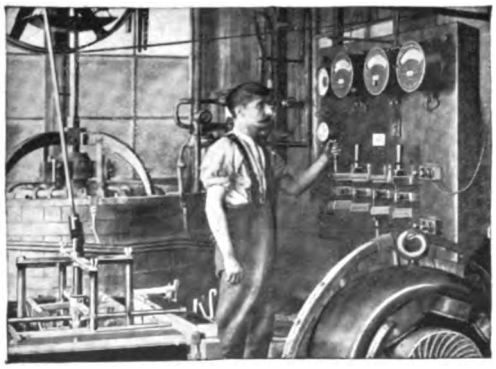
nating hand. Machines are wonderful enough, but "a hand's a hand for a' that," as Burns suggests to say. A lot of reduction of height was wanted, no doubt; but certain parts ought to be higher than certain other parts. The journeyman takes his heated pear-shaped or other "rising" iron, and applies to this a stick of wax which melts and joins with the mould at those spots and produces local elevations as desired.

The mould then goes into the blackleading machine. It is a dreadful thing that this should in any workshops be still a process open to the air. It's not in the



A Distribution Board.

contract that the journeymen shall be paid on Fridays partly in money and partly "in kind"—in blacklead absorbed into the lungs. Where's the Truck Act? The blackleading is boxed in all right in this foundry. The mould receives a graphite surfacing, which makes it conductive electrically. Incidentally it makes it quite a thing of beauty with a polished face, in which all the work can be seen.

Portions of the mould where copper is not wanted are stopped out with a hot iron, and the backs are painted out with melted wax or some other material which, as it is not metallic or metallised, will not be conductive, and so will not let any copper form upon it.

Electroing the Bad Original.

This much about the plastic moulds. Keep in mind all the time the dual nature of the work—that lead moulding is also adopted here, and is the method upon which this foundry prides itself most. For all the attributes I have just paid to the graphite-covered mould there is something else to be said, and that something else relates particularly to the imperfect block. This is an imperfect world, remember, and there are imperfect half-tone blocks and they have to be electro'd. The printer even seems to look for the electro to improve upon the original block, and the odd thing is this, that in some particulars the electro *can* improve on the original. The printer, not by reasoning, perhaps, but by accident, has stumbled on a truth. I will tell you of one such case in a moment: it would break the sequence to mention it here. Here and now I will only speak of the importance of an underbitten block being lead-moulded. "Underbitten," mind. I am not speaking of the under- or inadequately etched block, but of the block which is under-cut or underbitten. It is most desirable that these blocks should be moulded in lead, for if you must metallise with plumbago, as we have just seen done, fragments of the plumbago or graphite lodge or are entangled where this undercutting has taken place. The result is a degraded print. Nothing that could be done would altogether cure the evil. The great thing is to be able to do without the plumbago or graphite altogether. And lead moulding does without any such metallising film.

I see a number of sheets of lead

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specially prepared for moulding, and as we pass, the moulder, taking one of these, very quickly secures a mould of a large half-tone subject. It is the periodical work, the best half-tones and the three-colour work, for which the lead moulding is used in this foundry.

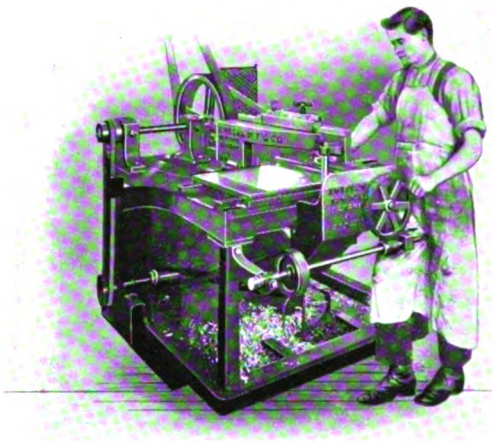
Dearer—and Cheaper—in Stages.

It would be as well to enter a caution. Do not infer, when I speak of the speed of lead moulding, that the process represents great saving of expense to the foundry. The moulds cost a great deal more than plastic moulds. It is only through saving made in other of the very long number of distinct processes which go to the making of the completed mounted plate that the electrotyper can afford to sell the lead-moulded electro at the price now fixed. No doubt the practical certainty of getting a good mould is a help to him. The customers would be surprised to know the trouble and cost often occasioned through moulds which have to be thrown away as imperfect in some respects. Dead men and dead moulds tell no tales, or a sound of a wailing might often vibrate around our foundries.

Our moulds having been made either by ozokerite or lead, I will pass now to the depositing tanks. Here the first thing I note distinctive of this foundry is the distribution board. Heavier currents than are common in electro practice are here employed, the purpose being to get quicker deposit. It is quite heresy to think that quickened deposition must mean spongier texture of the copper shell.

Spring Contacts—Ringing the Changes in Battery Connections.

It was difficult to get every workman to appreciate the precise niceties of working with these heavier currents. If arcing or sparking is to be avoided, the current must be shut off before the insertion or withdrawal of a plug. What was the best means to this end? The idea which the manager hit upon was a spring contact, its automatic action to permit of the current passing through before the coming of the plug into contact. He handed the idea over to engineers to work out. The arrangements here seem substantially to



The Rougher.

embody his ideas. One sees a plug loosely seated, with a spring inside it. By use of means thus simple the sparking has been abolished.

There are four motor generators in this battery room, and the completest possible use is made of this equipment. The battery men can use any generator they like or can split it up. They can switch any tank on to any machine, or can switch all the tanks on to one machine. Or in case of two machines running parallel, they can switch two machines on to any one tank.

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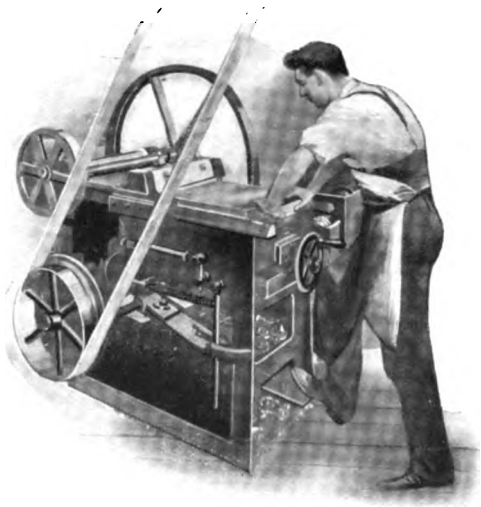
A Peril of Cleanliness.

It must be understood the conditions of deposition here decided upon have necessitated improved connecting apparatus. The special problem has been to get "contacts" capable of carrying comparatively heavy currents, these "contacts" to be very quickly made and quickly broken and yet remain efficient for more than a few days. Constant cleaning involves the tendency for the part cleaned to wear or become slightly out of truth. Ordinarily



A Planer.

the devices for suspending work in the tanks, the devices that make contact with the conducting rods, are so fashioned that they become out of truth with the first cleaning. It is very difficult, if not impossible, in using an emery powder or like cleaning agent, to apply equal pressures all over.

The Corey Agitator.

One thing to be noted in the depositing quarter is the Corey Agitator (patented). It is believed to be more effective than other agitators in breaking up the hydrogen at the kathode—that is, in breaking the bubbles which form at the shell. Agitation may simply be the churning up of a lot of slime at the bottom of a tank which it would be better to leave quiescent. With the agency of this agitator good shells are grown here, when the devil drives, in half an hour. For a freak, printable plates of, say, eight thousandths of an inch in thickness are grown in much less than half an hour. But I am not concerned with freaks but with business.

Making the "Steel" Electros or Nickeloids.

Another point. There is a tank here with a green-looking solution, and I hear that it is nickel and iron which are being deposited here. The product, "Nickeloid," is the famous plate which the firm has been advertising a good deal of late. It has stood a million runs, on rather trying stock, too, I believe, and has come up as smiling as Jack Johnson after a pugilistic mill.

"Nickeloid" cannot be as cheap as the copper electro. But does that so greatly matter? It would if it were always the right thing to order "Nickeloid." But it would be foolish to pay its higher price for runs easily within the capacity of the copper electro. "Nickeloid"—otherwise and popularly called the steel electro—is not, like the works of Shakespeare, "for all time": at any rate not for all times; not for all jobs.

Shot solder is not used in this foundry as the nexus between the shell and the alloy backing-up metal, with which that shell is thickened, as every user of an electrotype has noticed, or ought to have noticed. Tinfoil sheets are exclusively used in this foundry. Ten years ago this was perhaps the only foundry in London

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that did not use shot solder or tin bath. That could not be said to-day. Tinfoil has come. Its advantages include its being more even, and quicker in its application.

Points in the Finishing Room.

The Finishing Room presented more unlikeness to the ordinary finishing room ten years ago than it does to-day. I believe it is still true that there are certain differences, but I think these are more concerned with methods of handling than with the presence of particular machinery. To be sure, there are some things I have not often encountered. I notice an automatic saw sharpener and a notching machine for cutting out pieces in the sides of blocks when it is desired to run type around. A trimming machine I notice has micrometer adjustment: this trimmer cuts to half point. There is micrometer adjustment also on the shaving machine. The good old British bowler is used: one kind for metal and one for wood. Here are, of course, some fine radial routers. Back shaving is cleverly done. The plate is put in rather differently from the usual practice, and two cuts as a rule seem to be given in this back shaving operation.

Bevelling and Bending.

I notice next a bevelling machine for cutting rotary electros or stereos. It bevels both the sides and ends of plates. One saw saws to a gauge, and makes a bevel. You put the plate thus treated on to another cylinder in this machine, and another saw puts bevels on to the ends of the plate. This bevelling is done with the nicest accuracy.

Plates are curved in powerful benders, and that whether they are warm or cold. To be sure, the backing metal must be quite right; exact hardness is not the only thing one has to think of. And the copper, too, must be of right tensile strength if it is to be thus bent. These conditions observed, and the bender being made with precise truth in measurements, the bending process is comparatively easy. In fact, true bending, like a duck's quacking, has to be easy or impossible. Many an electrotype goes out that would not stand bending.

In register work it is most important to have all the plates of identical quality so that their stretch shall be uniform when they are bent.

Which does not exhaust the subject, but exhausts you and me and the space. I will, as I promised, tell of one particular in which the electro can improve on the original. It is in the joining up of brass or other borders at the corners. With the best of mortising and the best of imposition by printers, there is apt to be a perceptible gap here. The maker of the solid electrotype can make the union absolute. Q.

An American Compliment. — That quite splendid journal *The Printing Art* of America in its February issue reproduces some of the designs of Mr. A. A. Turbayne, the instructor in the design class at the London County School of Photo-Engraving. The designs appear in an article upon English decorative "end papers."

"The Hunter Process Pocket Book" is as usual crowded with facts, figures and information various, of the greatest value to the engraver. Its original matter has acquired high reputation for its expert authority and its opportuneness. Its format renders it most easily carried, and is indeed one of its lesser but very high commendations (Hunters, Ltd., Poppin's Court, London, E.C.).

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What it Costs to Make a Plate.

DESPITE differences in wage, in currency, or any other particulars, there is, we think, something very well worth the British and Irish engravers noting in the following conclusions which have tentatively been put forward by a Conference of photo-engravers which met at Chicago last February. We say tentatively, as it appears the Conference appointed (and financed by assessing each firm ten dollars for expenses) a Cost Commission to investigate and report to a future Conference. Meantime the Conference (as reported in the *Inland Printer*) put the following counsels and cost conclusions before members to be going on with:—

In estimating the size of half-tones, add one-quarter inch to the length and width for bevel.

On long narrow plates estimate the width as one-fourth the length.

Make no allowance for unmounted plates.

Make no sketches on speculation.

For retouching or grouping photographs and altering copy the cost is double the labour cost.

For hand-tooling or outlining cuts, and proofs in colours, the cost is three times the labour cost.

For half-tones from photographs or wash drawings, square finish, block measure, the cost is 5s. 4d. *plus* 3½d. per square inch. Minimum charge, 10 square inches.

For vignetting the cost is 50 per cent. more than for square finish.

For half-tones finer than 150-line the cost is 25 per cent. extra.

For extra negatives for half-tone groups the cost is one-half as much as for half-tones made to be inserted.

For two-colour half-tones from black-and-white copy the cost of each plate is double the cost of an ordinary half-tone.

For line etching on copper the cost is double the cost of half-tones.

For zinc half-tones, 85-line or less, the cost is 25 per cent. less than for copper half-tones.

For anchoring half-tones on blocks, 7½d. per anchor.

For zinc etchings from black-and-white line drawings or prints the cost is 3s. 6d. *plus* 1¾d. per square inch. Minimum charge, 10 square inches.

For reproductions from lithograph or steel plate copy, script, penmanship, and shorthand, the cost is 50 per cent. extra.

For etchings of colour plates to register the cost is 50 per cent. extra.

For laying tints for colour plates the cost is double the labour cost.

For reverse (white letter) etchings on wood the cost is 50 per cent. extra.

For metal bases, 3d. per square inch; minimum, 1s. 0½d.

For mortising on wood: outside 5d., inside 7½d. On metal: outside 7½d., inside 1s. 0½d.

The Cost Commission will conduct further investigation into costs, and these figures may be revised. It was, however, the unanimous opinion of those present that the prices would be found to be accurate costs on an average.

"MERTENS" DAY BY DAY.—It is reported that the Hamburg daily paper, the *Fremdenblatt*, has adopted the Mertens rotary photogravure process, to which so many allusions have been made in these columns.

ANOTHER EXTENSION.—"Eight times as much working space as we lately possessed." That is the jubilant note struck by Messrs. H. Williams & Co., of 16 Rosebery Avenue, E.C. These platemakers' engineers, as they especially are (and printers' engineers in general), have taken large concreted floor space next door to their old-time works. Their entrance is, as stated, 16 Rosebery Avenue, E.C., with a side workshop entrance in Warner St. Our representative was shown the newly fitted additional workshop, and how conveniently the power and lighting had been arranged, how ample it was, and what conveniences were now afforded for the expeditious output of customers' orders.

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The Costly Free "Bevel."

GEORGE H. BENEDICT, the prophet of the "scale" system of charging, points out that the use of the printed scale for measuring has one great advantage—even for those who prefer to continue quoting a fixed "per inch" rate. This is that the habit of measuring the block, instead of the proof, will make a difference of something over 10 per cent. in the income of a block-making house—supposing the per-inch rate remains unaltered. He estimates that the area of the bevel or beard is equal to about 12 per cent. of the face-measure of the blocks produced in an ordinary way of business. This estimate seems surprisingly high, but it is based on the ascertained facts of the Globe Engraving Company, Chicago, one of the very large concerns. That it should be a matter of surprise, and not of knowledge, one way or the other, is a proof of want of thoroughness in the investigation of the commercial conditions of half-tone, for the question of block-measure *versus* proof-measure has been raised many times.

Mr. Benedict writes us:—

"In line with previous efforts to do something for the good of the photo-engraving trade, I have had mailed to all the photo-engravers in the United States, a copy of a measuring scale with a letter as follows:—

"'The bevel on the average half-tone cut adds two square inches to the face measure. To measure half-tones by the proof means that you give away from two to five square inches in every half-tone you charge at face measure—about 12 per cent. of your half-tone output.

"'Selling half-tones face measure, is only one photo-engraving absurdity.

"'A lack of uniformity in charges for extras and unusual work is another.

"'The scale herewith has been gotten up to introduce uniformity in charges for all work that can be covered by a set price.

"'It is not intended that you shall adopt the scale, or adhere to the prices—but—you can use the scales and give them to your customers to measure the blocks; and you can use the reading matter to boost the price on transient orders, and for extras.

"'Do you want a hundred of the scales for two dollars, or an electrotype for five dollars? You can have either by sending the money with the order.'

A SUGGESTION TO OUR READERS.

"Of course, I do not know how much good it will do, but I do know that there are people in our line who are selling their half-tones face measure, and there is no regularity for price for unusual work.

"I thought, perhaps, you would be interested in the effort, and there may be a possibility that some use could be made of the measuring scale in England. You will note that the price I have named for an electrotype is very reasonable, and if you, or any photo-engraver, desire one, I shall be pleased to send it for the price quoted."

Most of our readers are acquainted with Mr. Benedict's "scale," but if any is not, and wishes to see one, we suggest that he sends four cents (twopence) in American stamps, which can be bought at face value from most money-changers and stamp-dealers, to Mr. G. H. Benedict, 407–425 Dearborn Street, Chicago.

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Facings and Pacings.

By "Ion."

[Under this heading we furnish each month notes upon matters special to the sphere of duplicate plate-making.]

I HAVE read with very great interest the book written by Mr. Thos. Catling, recording his "Fifty years in Fleet Street," under the heading *My Life's Pilgrimage*. Mr. Catling was fifty-three years responsibly connected with Edward Lloyd, Ltd., to be more precise in the statement of the term; and during a long period he edited *Lloyd's News*. He retired about four years ago. This half-guinea book is one to dip into at various times, and will certainly entertain any sincere worker in newspaperdom. I am going to quote at length the passage dealing with early stereotyping. Mr. Catling tells how Ged of Edinburgh invented stereotyping in 1729. In his method a mould was obtained by pouring liquid plaster of Paris over a page of type and allowing it to harden. The mould was then removed and placed in a metal box so as to secure a casting of the required thickness. A touch of romance lingers around the early history of the process, since a younger Ged, after being condemned for participation in the Jacobite rising, had his life spared on account of the usefulness of his father's invention.

To these facts I will add one or two. First, Ged was a goldsmith or watchmaker, like that later inventor (of the Linotype), the Swede Mergenthaler: two of the many instances of printing benefiting by the ingenuity of the rank outsider. Ged's invention was not recorded and preserved. Perhaps he was aggrieved at not being better rewarded for his pains. He had not been told, as we have been, that "invention is the mother of necessity." His secret died with him, and was altogether lost to the world for many years—as utterly lost as the invention of flexible glass is lost to this day. Stereotyping was re-invented; and I believe it was by one of the family of Foulis, the so-called "perfect printers" of Glasgow. A small book printed from the stereotypes of the inventor Ged is in the William Blades library at St. Bride Institute.

Mr. Catling continues: "For more than a century the plaster of Paris method, though admittedly slow and clumsy, continued in use. Then papier maché was tried, many experiments being gradually made in Germany and France. Two Swiss —the brothers Dellagana—having acquired a knowledge of the process, brought it to London. To them the credit of applying it in the most practical and simple way is undoubtedly due; but the desired end was only reached after close application, continued experiments, and prolonged labour."

The *Encyclopædia Britannica* tells the story of this Dellagana episode under the heading "Newspapers" as follows:—"About the year 1856, a Swiss named Dellagana introduced to the *Times* Koenig's idea of casting from papier maché, instead of plaster of Paris, and was allowed to experiment in the *Times* office. After a time the invention was so much improved that matrices of pages could be taken and the stereo plates fixed bodily on the printing machine in place of the movable type."

Mr. Catling reports an impression of Mr. George Wright, the registered printer and publisher of the *Times*, that "the *Times* was experimenting with Dellagana's process of stereotyping about the year 1858. Shortly after that date," says Mr. Wright, "stereo columns were used, im-

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posed in a curved box. About 1861, this arrangement was superseded by the page-curved plate.'

"While receiving a retainer from the *Times*, the Dellaganas set up a foundry of their own (Mr. Catling continues), and executed work for other papers. It was in this way that I became associated, as far as preparing the type was concerned, with some of their experiments. The 'turtles' of Hoe's machine, designed specially to hold type, required that any substitute, in the shape of stereo, should be type high, that is, ·918 of the inch, to be technically exact. A solid column of metal, with the requisite curve, was secured, but the weight proved too great for the revolving cylinders of the machine. Other methods failed on account of the pressure involved.

"When the stereo was lightened by being cast in the form of an arch, solid at the sides, but hollowed down the middle, the printing caused such a depression as to make it appear with a white space down the middle of each column. An entire page baffled the inventors, because there was no way of securing it on the cylinder.

"Even after the idea of abandoning the 'turtle' in favour of a bed to hold the stereo plate came into consideration, the way seemed difficult. From a mould taken from a page of flat type a plate of the usual thickness of three-sixteenths of an inch was cast; but it could not be bent to the required curve with any certainty. If it did not crack in the bending, it failed through some defect or inequality in the packing up.

"Colonel Hoe, apparently, had not grasped the situation, for he was relying on the continuance of printing from type for some time longer. In that same year an application was made on his behalf for an extension of the English patent for the rotary press. It came before the Privy Council on 1st February. . . . The scene," Mr. Catling proceeds, "comes vividly to mind, as I was called upon to exhibit to their lordships the technical method of securing the type in the 'turtle' that was before them. With Colonel Richard Hoe were Mr. Edward Lloyd, Mr. Edward Levy (now Lord Burnham), and the legal gentlemen engaged.

"The petition stated that the machines were very expensive, and consequently for many years the patentee was unable to induce newspaper proprietors to give orders for them; that he obtained no orders in England till after the alteration of the Stamp Duty in June 1855; that the first order was in 1856, for *Lloyd's Weekly Newspaper*, and up till that time the patentee had only received orders for fourteen machines.

"After hearing evidence as to the novelty of the machine, Lord Cranworth said: 'Looking at this patent, we are all satisfied on the score of its merits, that it is a most useful invention, possessing the great merit and charm of simplicity as far as such a subject can be made simple.' An extension of five years was then granted, to date from the termination of the existing letters patent, which were to run for fourteen years from 4th May 1847.

"As the demands of newpaper proprietors became more and more urgent, stereotypers found their opportunity, and the now familiar process was developed. Taking a cast from a page of type on the flat, the papier maché mould or flong was made flexible enough to be bent, and when this was placed in a curved casting box, plates were readily made to fit any machine. Before this amazingly simple discovery could be adapted to *Lloyd's*,

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it was necessary for Colonel Hoe to provide fresh beds for the stereo plates in place of the discarded 'turtles.' These were designed and made in America. Thus it was that *Lloyd's* had to wait till 2nd February 1862, before it could be printed from stereotype. The *Times*, with the assistance of the Dellaganas, had been enabled to secure the great advantage of the new method some time previously."

The Modern Dark Room. ✓

By E. Kenneth Hunter (of Hunters Limited).

Suggestions for Fitting up a Dark Room for Dry-plate Process Work.

With the adoption of dry plates by process workers, certain modifications in the arrangement of the dark room have become necessary. Those already using wet-plate dark rooms have probably found it necessary to adapt them to the new requirements as far as possible. While these remarks are addressed chiefly to those who wish to fit up dark rooms *de novo*, the writer hopes that they will also be found useful to those who are compelled to make the necessary alterations to their present dark rooms.

It should always be remembered when fitting up a dry-plate dark room that the greater part of the work will be done in a more or less subdued light, consequently everything that is likely to be required for development should be handy and placed where it is to be seen readily by the light of the lamp. The bromide and developer bottles and the measures and dishes should be within easy reach, but out of the way, so that they are not accidentally knocked over, and should not be left lying about the actual working bench.

Situation and Construction.

These, of course, depend to a certain extent on the nature of the building, but the dark room should be near the studio, and if possible lead out of it. It should be fitted with two doors, so that operators can go in and out without letting in light; or a number of rooms may be made to open into one passage, at the end of which are two successive doors, as well as a door to each dark room. Then if only one of the passage doors is opened at a time, daylight will never enter, and any of the dark room doors can be opened without danger.

Exclusion of Stray Light.

It must not be overlooked that dry plates are a great deal more sensitive than wet plates, and much greater precautions, therefore, have to be taken to ensure that no white light reaches the plate during the various operations of loading, developing, etc. In building new dark rooms it is a good plan to have them constructed of one of the modern cement-like partitions which do not allow any light to come through, and make a perfect join at the ceiling and the floor. If built of wood, it is advisable to line the dark room inside with two thicknesses of black waterproof paper; it may also be necessary to line the door frames with felt. When the dark room is finished, go inside, turn out the light, and wait for five or ten minutes; by this time the eyes will have become so accustomed to the darkness that even the smallest shaft of light will be observed; the position can then be noted, and felt or waterproof paper nailed over the crack.

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Heating and Ventilating.

The heating of the dark room is important both from the point of view of health and also because it is desirable to keep developers and all solutions at an even temperature of 60° to 65° F. Most developers work very slowly when cold, and, in fact, hydrokinone, which is largely used for process work, is one of the worst offenders in this respect, as at about 40° it loses its developing power entirely. It will be seen, therefore, that it is better to provide a means of heating the dark room and thus keep the developers at a fairly even temperature, than to spend four or five times the normal time in developing each plate.

The method of heating must depend to a certain extent on local circumstances. In buildings heated by hot-water pipes this method can easily be arranged for in the dark room, and is to be recommended as unquestionably the most satisfactory and efficient. It might even be worth while putting in for this purpose a small hot-water installation heated by gas or oil, such as is used in conservatories. The only other alternative (except electric heating, which may be ruled out as being too expensive) is an oil stove, and there are a number of very suitable ones on the market. Care, of course, should be taken that direct light from such a stove does not reach the plate.

The natural accompaniment of heating is ventilation. Some means should always be provided for ventilating the dark room (a matter which is even more important than the heating), for it stands to reason that the air, in an enclosure that is light-tight and almost air-tight, is soon vitiated by the operator working in it, and unless steps are taken to change the air in the room, the health and working capacity of the operator must suffer. The simplest way to ventilate a dark room is to cut a hole in the wall near the ceiling, or in the ceiling itself, preferably over the lamp; a shaft provided with a light-baffle is carried out to the open air, or, if this is not possible, into a larger room where the air circulates better. This will carry off the hot air which rises to the ceiling, and a similar shaft should be provided on the other side of the room near the floor, likewise leading from the open air, to admit fresh air. An arrangement such as this will at least prevent the air from becoming absolutely stagnant; and if an electric fan is placed in the outlet shaft, a steady circulation will be readily maintained. For a number of dark rooms it will be economical to have all the outlet shafts connected with a main shaft of galvanised piping, and a larger fan at the end of the main shaft.

Lighting the Dark Room.

Undoubtedly, the most efficient illumination for the dark room is electric light. It creates practically no heat, does not consume any air in the room, and is readily switched on and off. Current is usually laid on at process shops on account of the arc lights, and it is consequently neither a difficult nor an expensive matter to have it installed in the dark room.

Provision should be made for one white light in the centre, hanging from the ceiling in the usual manner, for general illumination purposes, when actual loading or developing of sensitive material is not going on. Then a combined wall-plug and switch are convenient for the dark room lamp, which is connected by means of flexible wire. It is also desirable to make provision for a lamp on the bench, for bromide printing, transparency making, etc. The light in the centre may be controlled by two switches, one at the

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entrance to the room, and one near the sink, so that it may be switched on and off without going across the room. A light behind a piece of opal glass over the sink may be fitted for the purpose of examining negatives, and this could be controlled by a spring switch on the floor, actuated by the foot, thus leaving the operator free to hold his magnifying glass and negative.

The dark room lamp should be large and of the pattern in which reflected light only is used, similar to the Wratten lamps. These lamps give a surface of diffused light 10 × 8 inches, by which everything can be easily seen. Safelights of accurate and tested colours should be used in preference to canary fabric or ruby glass of unknown or doubtful spectrum transmission. The use of red and yellow electric globes is likewise to be avoided, because they are liable to be unsafe and cause endless trouble.

The best position for the lamp is at the left hand side of the sink or work bench, and slightly above it. It will then throw a bright light right across the bench, sink and shelf, and enable the operator to see what he is doing.

Sinks.

Dark room sinks may be of several kinds; plain wood, lead-lined wood, stoneware, etc., according to taste. The writer favours lead-lined wood, as it is impervious to the chemicals used in dry-plate photography, and less dangerous to valuable negatives accidentally dropped in the sink.

The water supply needs no particular notice, except, perhaps, that "Anti-Splash" nozzles may be fitted to the taps with advantage.

The waste pipes for carrying off the water from the sinks should be of large diameter, and should, if possible, run into a gully, so that in case of obstruction they can be easily cleaned out with a long bamboo cane—an operation which is not so easy when the waste is connected direct with the soil pipe. In the same way the wastes from a number of sinks can be made to run into one gulley.

Benches, etc.

The disposition of the benches is largely a matter of personal opinion. Some people prefer to place the developing dish in the sink, or rest it on the ledge. The writer's preference is for a lead-lined bench, level with the top of the sink, on the left of the latter, and large enough to hold the largest size of dish it is intended to use. This can be washed down after use, and leaves the sink free for washing negatives, and for the fixing bath, which stands at the right-hand end.

On the right of the sink is a bench level with the bottom of the sink, which is used for loading slides, printing, etc., and which should be kept dry. A couple of drawers under the dry bench are very handy for storage of sensitive paper, etc., and a cupboard may be added to take the stock of dry plates. A shelf just above the sink for measure glasses, and another higher up for stock developer, etc., are necessary; also a rack for dishes is conveniently placed under the sink.

Drying Cupboard.

A useful addition to a dark room is a drying cupboard. These may be purchased fitted complete with racks to take plates and some arrangement for heating, such as a gas burner or electric heater. The latter forms by far the most satisfactory method of drying, and the absence of fumes makes

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it just the thing for the dark room. The use of a drying cupboard is, of course, chiefly for drying negatives, but if placed in the dark room it can be also used for drying bathed plates, sensitised photo-litho paper, carbon tissue, etc. A fan may be placed at the bottom of the cupboard to drive the warmed air through and thus promote rapid drying.

CONCLUSION.

In the nature of things the points dealt with above must be necessarily governed to a certain extent by local conditions. Cast iron rules are out of the question here, but it is hoped that this summary of points which must arise in fitting up a modern dark room will prove useful to those engaged upon this task.

Index of Current Literature.

As elsewhere mentioned, a new Mertens patent, concerned with intaglio, is noticed in the *British Journal of Photography* of March 17th.

"Scientific Colour in Practical Printing" is discussed in No. 12 of Mr. E. C. Andrew's articles in the *Inland Printer* (American) for March.

Asphaltum or collodion moulds from electros, dry enamel process, rotary photogravure, and reversal of transfer for offset, and other matters relating to offset, are treated in Mr. Horgan's "Process Engraving Notes" in the *Inland Printer* for March.

"Costing for Engravers" is discussed in the March *Inland Printer*. The contribution is important, and is quoted in another column.

"The Ownership of Electros" is the subject of comment in the March *Inland Printer*. The writer's point is that in the absence of a special agreement the electros should always remain the property of the printer unless he has been instructed to have them made.

"How to order Engravings" is discussed in the February *Printing Art*; particularly it is impressed that all instructions should be written, that in the matter of designs the paper should be decided upon before the final drawing is made; that the screen should suit the drawing and the paper used; and there should be harmony between type, illustration, decoration and subject matter, the artist being consulted as to this.

"Chromatic Combinations" are discussed by Eugene St. John in the February *Printing Art*. The supplement illustrations to this journal include several four-colour half-tones and a "mezzogravure" machine photogravure.

A variety of subjects are treated in the March *Zeitschrift für Reproduktionstechnik*. It has articles on "Rotary Photogravure for Newspapers"; "Comparisons of different Reducers and Intensifiers"; "Some Experiences with Etching Machines"; "Albert Process"; "Corrections on Zinc Plates"; and "Exposures on Lighting Apparatus to be reproduced in Catalogue Work."

In *Process Work* for March the "Questions and Answers" relate to developing "Line Prints on Line"; "Fixing together Line Plates"; and "Picric Acid." There is an interesting item on "What your Studio Plant is Costing You." We give this next month.

The *Graphic Arts* for February contains a reproduction in four printings of a direct three-colour from Nature of a winter's scene and an offset colour print of an automobile: also a photograph in colours from the object. Among the articles is one deprecating the vulgar comic illustrations now current in American newspapers.

"Newspaper Illustration in Germany" is described in the *British and Colonial Printer and Stationer* for March 9th. The article deals with the Mertens process. It also deals with a new process used by the *Central Anzeiger* of Magdeburg whereby improved results are obtained with ordinary relief blocks.

"Are Block-makers the legitimate Three-colour Printers?" is discussed in the current *British Printer*.

"Newspaper Half-tones" are discussed in the *British Journal of Photography* for March 11th, and in the issue of March 18th. "The Production of Labels by Photomechanical Means" is a subject treated. In the same issue the Mertens patent for re-etching intaglio plates is noted.

The *American Printer* for March gives details of the system for keeping track of blocks received and of blocks sent away. In the same journal there is an interesting screen chart showing eight different screens. The sections representing these screens are also sections of an actress's portrait—a happy idea which assists the comparison.

The American *Engraver and Electrotyper* in its current issue has an article directed to show that collotype is gaining favour.

The *Platemakers' Criterion*, America, gives a further contribution to the cost problem in the form of an article by Louis Flader.

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My Causerie.

THE disputation as to whether engravers proof their plates on hand-presses with stiffest possible ink or on platens and with lighter inks is still worrying us. It is "getting no better, fast." I am not able to speak for the whole body of engravers. I do aver that it is habitual with certain London engravers of importance to pull on platens, and naturally under ordinary platen conditions. They do this not because they are angels, but simply because they are not fools. They are not looking for trouble, and they feel that the ideal way in which to bring trouble about their heads sooner rather than later is to go on sending out hand-press proofs. They want to devote themselves to making profit and not to making profitless correspondence.

It would really be rather a foxy thing to do to issue hand-press proofs when one had a platen available. But the engraver who needlessly acted the fox in this wise would be rather a fool of a fox.

Engraving friends of mine who habitually proof on platens are somewhat annoyed at the insistence on the story that they use flat hand-presses. But that is not to be understood as meaning that they feel any grievance against any and every man who happens to pass on such a statement. People keep saying this thing because they believe it. They probably know some engravers who do habitually proof in this way, and they may very naturally infer that the rest do the same.

To be sure, it is absurd to expect that the small man who has barely enough capital to make a start at all will load himself up with liability for a good platen if he can serve his present ends by buying an effective hand-press for possibly much less. Really good platens of large size are very expensive; you may easily find yourself committed to pay a sum in three figures for one—perhaps far over the £100; and possibly you can pick up a very serviceable though old hand-press for £25, or even a good deal less.

No doubt the man who starts in a very small way is wise to do as soon as possible the sort of thing which it will be natural and proper for him to do as soon as he becomes moderately successful. He should get away from all modes and methods ordinarily attaching to "distressful conditions." He should anticipate by a little the usages of success.

The process engraver or printer, even when he has no office staff to speak of and not much unproductive expense of any kind to be plumped on to his costs, must bethink him that he won't be able to go on permanently without a dead weight of such unproductives; and the sooner he begins making some charge in anticipation of that coming day the better. Otherwise he may find himself, later on, loaded with access of unproductive costs and scarcely able to put up any access of invoice figures to correspond to them.

Mr. Fred T. Corkett has come back from New York, but only for a short visit, so far as I know. He has only golden opinions of the few men in the graphic arts of America with whom he has come into intimate contact. He likes the enterprise, the vigour which he has personally experienced, the readiness to spend freely in quest of craft improvement, and a certain handsomeness in the way of dealing with those employees who really put their heart into their work. But he has not come back to spread the tale that the British is inferior to the American considered as a business man. He finds that the Americans who are controlling large businesses like the vim, the force, the ideas of the Briton who is really awake. "It's all very well," one very big employer in a colour-printing works said to Mr. Corkett; "it's all very well to talk about the American hustle. It's pea-nut talk, mostly. We want men of the right sort from your side."

Mr. Corkett is on the Continent at this moment; but he will be back in London very soon, possibly he is back while I am writing. Anyone who would like to meet a very wideawake rotary intaglio worker might communicate with me and I could put him in touch with Mr Corkett. He has apparently accomplished more success in this interesting line than any man of my acquaintance.

I was very much interested the other day to read in Benjamin Franklin's *Memoirs* how he turned to an engraving job when he saw a chance of getting the printing of cheques.

"When New Jersey wanted paper money, I contrived," he says, "a copperplate press for it; the first that had been seen in this country. I cut several ornaments and checks for the bills."

Another engraving allusion looks out incidentally from the record of Franklin's type casting.

"Our printing-house often wanted sorts, and there was no letter-foundry in America. I had seen types cast at James's in London, but without much attention to the manner; however, I contrived a mould, and made use of the letters we had as puncheons, struck the matrices in lead, and thus supplied in a pretty tolerable way all deficiencies. I also engraved several things

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on occasion; I made the ink; I was warehouseman; and, in short, quite a factotum."

No one better than the engraver can appreciate the self-reliance, the *savoir faire*, the happy knack in meeting difficulties which this Franklin trifle serves to illustrate. He seems to say to us: If you haven't got resources, try resource.

I hope readers of this issue will note the account of "An Hour at the Foundry of the King's Printing House." There is just one thing which I think might be usefully added. Where you electro by lead moulding a block that is badly underbitten, it may well work out that the electro proves in the course of a long run to be a great improvement on the original. In this way. The hard enamel on the original becomes worn through as the run drags out its length, and the breaking down of the underbitten dots very soon happens once the enamel has gone.

This soon expresses itself in a degraded print. But the electro was a replica of the block as it was at its best, while the enamel was protecting the underbitten portions. The electro does not degenerate correspondingly to the degeneration of the enamel-worn original. Its prints may therefore show a marked and a progressively increasing superiority to the prints from the original.

There is yet another point involved in this—namely, that the pressure which is put upon the blocks in the lead moulding is not apparently as great as one might have supposed. If the lead moulding imposed an immense strain, the underbitten dots surely must reveal it.

I take it science is far from having said its last word to us on this subject of pressures. What a remarkable thing it is that gelatine, in any condition, should have been pressable into lead. Yet Woodburytype depends for its admitted and quite beautiful effects upon the fact that this amenable substance can be pressed into the relatively hard element of lead without injury to a picture inwrought into its face by the swelling method.

FRANK COLEBROOK.

Brevities.

THE ANGLO-ENGRAVING CO., LTD., ENTER LARGER PREMISES.—The following circular is issued by the Anglo-Engraving Co., late of 14 Farringdon Avenue, London, E.C., but now, as will be seen, of Milford Lane, Strand, W.C. The message to the public is conveyed on a green folder 8 × 5. In suitable green and gold chrome printing the fore page of the cover indicates a fine oak tree. Affixed to the bottom of the 8 × 5 folder is a 3 × 2¼ folder in a different tint, folding over the larger one, so far as it will go. It is marked 1897. This is a graphic representation of the growth from that starting year. The larger cover is marked 1911. The circular runs:—

"When we first started in business fourteen years ago our staff amounted to four, all told.

"The excellence of our work and the convenience of our service were soon appreciated: and rapid growth has inevitably followed.

"To-day we have three large works—in London, at Raynes Park, and in Glasgow—and our employees number 180.

"We possess the largest plant in London devoted solely to the making of half-tone and line blocks, and the necessary designing and photographic work; and we can produce perfect and clean-printing blocks in all sizes from one square inch to 42 × 32 inches.

"The development of our service has kept pace with the extension of the business, and we have now adopted express cycle and motor deliveries all over London.

"The increase of our London business, resulting from the first-rate quality of our work and from our efforts to secure the convenience of our customers, has been so great that we are forced to abandon our present premises in Farringdon Avenue, and on and after 27th March we shall be installed in much larger and more suitable works in Milford Lane, Strand (just west of Temple Bar).

"Here we shall have even greater facilities for operating to the best advantage our present magnificent plant, and for adding to it any further improvements which may be introduced from time to time.

"It is important to note that our Directors are the sole shareholders in the Company, and that no printer, publisher, newspaper, or advertising agent has any holding or interest in it."

A COMPARATIVE NOTE ON LUMIÈRE AND THAMES PLATES.—Mr. Colman Starling writes to the *Westminster Gazette* regarding colour photography:—

"All three-exposure processes appear to me too complicated for ordinary workers, and therefore the colour-screen, with its single exposure and transparency as a final result, seems the only solution at present.

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"The geometric screen with its separate negative seems to me more suitable than the dust-screen process, as a spoilt plate by the latter method means the loss of a screen, while by the former method only a plate is lost, and much can be learned from failures. Another great advantage lies in the fact that screen negatives can also be used for making ordinary prints. During the winter I have been trying the Thames colour-screen so as to get to know its peculiarities before the spring season comes on, and, as far as I can judge, it gives promise of good results. I even anticipate doing hand-camera work with it."

"To say that any process of photography is 'too complicated for ordinary workers' will arouse adverse comment in many quarters, but generally," writes the *Gazette*, "we may agree with our correspondent. The three-colour processes, by which beautiful results are attained, are for the select few who either work professionally or who have the most ample leisure and painstaking skill. The apparatus required is expensive and demands careful manipulation, and for these and other reasons these methods may be regarded as outside the range of the ordinary worker. When that is said the main question of our correspondent is answered. One only has the screen-plate, and must be content with the transparency as a final result."

The writer proceeds: "In our own work we have not yet found anything so satisfactory as the Lumière screen-plate, which was first introduced — satisfactory, that is to say, in the certainty of its working and the perfection of the reproduction of colour. The Thames colour-plate gives more than the promise of good results, and is simple enough in working; but the pictures taken do not strike one as quite so true to nature in colouring as those on the French productions. The use of a separate screen has the advantage which our correspondent points out—the spoiling of a plate does not mean the loss of a screen also. This, however, seems to us to be more than compensated for by the fact that there cannot be true optical contact between a film and a separate screen, and for good pictures this seems at present essential. In our own experience we have found the Thames plate rather faster than its competitor, and that is a consideration that counts for much. It is a great pity that the colour processes have made so little headway in the affections of photographers, but the chief reason for that has already been discussed at length in this column."

School Notes.

PRIZE NIGHT AT WILD STREET SCHOOL.—This school, in Kingsway, is by way of being a centre of supply for printerdom. Its head master is an enthusiast in the particular task of equipping lads to do most justice to the craft of Caxton and to themselves. The governing body lately set a kind of seal upon this character of the school by appointing Mr. G. Eaton Hart, director and manager of St. Clement's Press, Kingsway, a governor of the school. On the 8th inst. the annual prize distribution took place. Mr. R. I. Tasker, J.P., L.C.C., presided. Mrs. Tasker presented the prizes, and Mr. Hart and Mr. A. J. Newton of the L.C.C. School of Engraving spoke to the lads. Mr. Hart said that from observations upon his own apprentices the school was doing its part most admirably. To each St. Clement's Press apprentice who received a prize that evening the firm would award a second prize of equal value. Mr. Newton said nothing was more disheartening to the technical teacher than to find that the boys coming to him could scarcely profit by the instructions given at the technical school because of their lack of a groundwork of general knowledge. No one disputed the value of education, but there was much disputing as to whether that which was given was of the right kind. The Wild Street course aimed always at the training of the thinking brain, so that industry might secure better craftsmen. Education was twofold: it aimed to enlarge a lad's outlook upon life, and to make him more efficient in his particular calling. In both these respects printing would repay time spent on education as well as would any industry. One must be learning all the time; one must get the habit of learning; and the habit could be acquired at that school almost without effort. Every lad worth his salt inevitably came to the time when he felt he must know more if he was to do any good in the world. If he put in no time at study after leaving school he soon found he had forgotten pretty well all that he ever knew; and then he must begin again or must fail to effectively comprehend the special instruction of the lack of which he became conscious. These classes were very important. They were a bridge between the elementary school and the technical institute. They also educated a lad generally, and prepared him for citizenship and the larger duties of life.

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Estab. Jan. 1894.
"The Process Photogram."

THE PROCESS ENGRAVER'S MONTHLY

Vol. XVIII. No. 209.
MAY 1911.

AND ELECTROTYPER'S AND STEREOTYPER'S REVIEW

Grave Copyright Considerations.

We would counsel our readers to give serious attention to the Government's Copyright Bill. The matter is, no doubt, one on which the greatest contrariety of honest opinion may prevail; but on one thing we must all agree—it is of great importance. We think of the engraver in this copyright connection as a dual personality—as engraver and as a member of the public. It might unfortunately befall that the interests represented by the two characters conflicted. In that case there should be an immediate effort towards the adjustment of relations. No occupation which conflicted with public interests ought to find a longer tolerance than might suffice to secure its euthanasia. British usage is tender to every established interest, even to those that are recognised as having developed features of an anti-public character, and there is no doubt something to be said for a nice and anxious avoidance of sectional injustice while pursuing justice on the large scale.

Is this, however, a case in which any such puzzling considerations arise? We think not. There would appear to be a clear call to the trade to express itself as an economic entity, and to express itself with a specific protest. Engravers everywhere should be against the extension of the copyright of a literary work to so monstrous a term as proposed by this Bill—to fifty years after the death of the author. The embodied offer of fifty years' copyright (from the time of the camera stage) for the engraved plate should not prevent their opposition.

It may seem whimsical, but a certain analogy from the Yorkshire or other north-country moors comes to mind. In our roamings over these great uplands we found in many cases that the dwellers in the countryside were not permitted to obtain peat from those moors for fuel. We raised the question whether there was at any rate the mitigating plea arguable by moorland owners that the peat from which the peasant was thus debarred was but reserved to be fuel for hearths of some other year. But we were assured that peat not extracted in due time simply decomposed, and would never be available for the fireside of distant days. Other fuel might be found in the same place; but so it would have been, had the ground been made to yield periodically and frequently its caloric wealth. Just so with most authors. Not a great many authors will be alive ten years after they are dead! But during their diminishing fame, while its natural seven or ten years' term is running out, their works would sell usefully enough, provided the price asked were a low one, which this Bill threatens to prevent.

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The present copyright law is that of 1842, commonly known as Talfourd's Act or as Lord Mahon's Act; sometimes also spoken of as Macaulay's Act, from the circumstance that his speech on its second reading was one of the events of Parliamentary history. Under that Act copyright in a book or piece of literary work or in a plate or in a photographic negative attaches to the writer or the platemaker or the photographic operator, from the simple fact of its creation. He has nothing to do at Stationers' Hall or anywhere else to create this right. But in the somewhat curious workings of our law, he must have paid his 5s. fee at Stationers' Hall or he will find he is not able to sue for the infringement of his undoubted copyright. That disability, to be sure, the Buxton Bill might remove.

Copyright in engravings, maps, and things classed with these, is now secured by several Acts and lasts for twenty-eight years. Each plate or print to be thus protected must bear the name of the proprietor. Copyright in paintings, drawings and photographs is secured to the artist during his life and during seven years after. This is by an Act of 1862. A register of copyrights in paintings, drawings and photographs is kept at Stationers' Hall.

There have long been many clear defects in copyright law. It is complained indeed that the Acts which relate to the subject are very ill drawn. None the less the public should not imitate the man who cut off his leg to cure a corn. And even he did not cut off his leg to cure a corn on someone else's foot. The suggested remedy for any existent copyright troubles is a measure which in a great many cases would maintain a coveted literary work in copyright for seventy or eighty years; for the most popular works of many authors are the product of their early manhood. *Pickwick* was the work of Dickens's early twenties. Scott was older, but still young, when he issued his "Lay of the Last Minstrel."

The problem in the case is simply the ever-present problem how to determine the conditions of "maximum return." In phrasing less redolent of the economist and more of the retail market, the problem is to see just how cheaply a book can be sold to make the enterprise involved one well rewarding all parties. But it is just here that this extraordinary Bill comes in. The author, with his natural wish to be read by the million, a wish restraining his thought of a high price, has died. There are only his descendants or copyright assignees to be dealt with. By common experience they are not very jealous of his extended fame in comparison with their jealousy of their own revenue. By common experience, too, they easily, though probably quite wrongly, persuade themselves that for them the "maximum return" is securable by maintaining the books at high prices. That is the easier seeming course. And the burden of investigating and balancing may naturally look forbidding. It used to be said of some Scotsmen that if they did not prefer Scotland to truth they did prefer Scotland to inquiry; and an author's descendants may very understandably shrink from unfamiliar investigation and prefer a reasonably probable small revenue to a conjectural larger income from issuing works at low prices. Our concern is with the fact that this natural and generally noted decision by authors' assignees means diminished reading by the public. That in turn must mean diminished use of "engraved images," as Hogg, the quaint Ettrick Shepherd poet, called illustrations.

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It may be that the falling-off in the supply of works of high quality, which must be expected to result from this Bill if passed into law, may be accompanied by an increase in literature of the more rubbishy sort. That ghastly evil, for it will be nothing less, is not likely to have for accompaniment any such large use of illustration as would attend continuance of the to-day's noble issue of cheap works, now threatened with arrest and virtual extinction by this legislation. Virtues run in pairs; and a fine enterprise and fine taste in literature are likely to be accompanied by a worthy spirit in pictorial work. But for the publisher for whom any sort of book is good enough, so only it will cozen the people's pence, any sort of illustration or none is also likely to be deemed sufficient.

We would urge our readers to obtain a copy of the Bill (it costs but 3d.) and to consider its features carefully, taking long and wide surveys. It will be well to revive acquaintance with such provisions of present copyright law and such embodied proposals as specially affect platemaking. Copyright matters are non-controversial in the party sense, and even the House of Lords stage might be made the opportunity to introduce any needed amendments. Lord Morley should be the last man to abet legislation looking to a serious restriction upon the supply of fine literature to the public at popular charges.

If it were not for the peculiar circumstances of the time, it might seem superfluous to labour the enormous importance of the matter. The effect of copyright is not usually belittled. In America a new and great supply of native literature came into existence responsive to legislation which checked the practice whereby American publishers kept issuing cheap reprints of British classics and ignored the manuscripts of native American authors. We are familiar, too, with the lamentation of the British author that he is not entitled now to copyright in the United States unless he has printed his work from types composed or from plates made on United States soil. Whatever may be thought of these things, none can say that they have been matters of slight import in the States. Neither are the changes likely to be made in this country by the Copyright Bill of 1911 of other than the highest moment. And for the modification of the Bill in the truest interest of the public, and of the platemaker, there is now only too little time. Certainly there is no time to lose.

Working Process by Daylight.

By R. W. Douglas.

Now that the days are lengthening, an account of a beginner's attempts to work process by daylight may prove of interest, especially as the apparatus employed, with the exception of the screens and lens, was mostly home-made.

An old 15 x 12 camera was bought for 5s. with one bookform slide, but without a lens. The back of this camera was deepened by the addition of a 4-inch wooden box-piece, so as to admit of an inner casing, not so deep, that would slide in and out like a drawer. Across this inner casing two strips of wood were screwed to hold the screen, and in the outer box-piece slots were cut, through which brass pegs were fastened to the

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inner casing, to permit of the latter being moved at will from the outside when the dark slide was in position. The two wooden cross-strips also were so cut that they projected forward beyond the level of the outer case, in order to secure the necessary proximity with the sensitive plate. In this way the screen gear was evolved.

To obtain a fairly accurate register for screen distance, upright indicators were soldered to the shields covering the slots through which the brass side-pegs passed. The screen was then fastened in its place, the dark slide, containing an old negative, put in position, the shutter pulled up, and the inner case drawn forward by means of the brass pegs, until screen and negative touched fair and square. A millimetre scale was then fixed to each side with the indicators directly under the zero.

The camera was next mounted on a wooden box and the front fixed, so that all focussing should be done from the back.

An ordinary wooden table was used as a copying stand, a board being fastened at one end to take the originals, and two runners nailed at right angles to act as guides for the camera, slots being cut in the box, on which the latter was mounted, to correspond.

The screens were half-plate, trial size, purchased from Messrs. Brown of Leicester, and the lens, an 8½-inch Wray R.R. with iris diaphragms, covering half-plate at full aperture. The reversing mirror, the box of which was home-made, was fastened *in front* of the lens, a slot being cut in this latter to permit using additional diaphragms.

The plates were Ilford "Process" and "Half-tone," and a Wynne actinometer to gauge exposures with.

Developer always the one formula :—

A.	Hydrokinone, potass. metabisulph.	
	potass. bromide -	½ ounce each.
	Water - - -	20 ounces.
B.	Caustic potash - -	1 ounce.
	Water - - -	20 ounces.

The "operating" was mostly done indoors, with a side light from a north window, white paper reflectors being placed beneath and at the side of the original farthest from the light. Exposures for the shadows in August with *f*/64, and in February with *f*/45, were from four to six minutes, with proportionate high-light and flash; time about mid-day, and to obtain a negative half size of the original.

The "Process" plate, when used in connection with the above developer, seemed of greater speed than *f*/16, which is the figure it is entered at on the Wynne card, *f*/32 being nearer the mark. Using this latter stop in the lens, and taking a "line" original the same size, if actinometer and plate were exposed together, and the lens recapped when the lighter tint was reached, a good negative resulted. Four times the "line" exposure with good black and white copy gave that for "half-tone."

(*To be continued.*)

HARE & COMPANY LTD.—This company has been registered with a capital of £4000 in £1 shares. Objects: to carry on the business of manufacturers of, and dealers in, photographic or other sensitised plates, films, or papers, photographic or other chemicals, and cameras, lenses, and accessories of all kinds, etc.; also to adopt an agreement with L. E. Clift for the acquisition of the business carried on by him as Hare & Company. First directors, L. E. Clift (chairman and permanent managing director), S. Wenham, R. Andrews, W. J. Barnard, and A. D. Smith. Qualification, £20. Registered office, 1 Holborn Place, High Holborn, W.C. Private company.

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An Orthochromatic Filter: Some Experiments.

By A. J. Bull and W. J. Smith.

[An address delivered before the London and Provincial Photographic Association on 6th April 1911.]

We have frequently noticed that in the orthochromatic copying of pictures with electric arc light the reds are rendered too light in tone when using a yellow filter on a good bathed plate. Although the effect is small it has had to be corrected occasionally for critical work. This has been done by mixing a little of some blue dye with the yellow in a liquid filter.

With a view to ascertaining one set of conditions which would give as accurate an orthochromatic rendering as possible, the following series of experiments were made.

First, a colour sensitometer was constructed. This took the usual form of a series of transparent colours which were graded down to equal visual brightness by placing over each a piece of photographic negative of suitable density. This question of the adjustment of dissimilar colours to equality is still one of some difficulty, for none of the older methods can be considered at all satisfactory.

Of the three types of photometer available—the luminosity, the discrimination, and the flicker—the second was scarcely applicable, while the flicker in our hands has not yielded the concordant results claimed for it. A good luminosity photometer was finally selected, but the method used made an endeavour to refer the results to a matching of similar white lights.

The photometer head was placed between two electric lamps about three metres apart, which were not connected directly to the mains, but the current for each was taken off by means of a sliding contact from a resistance placed across the supply mains. In this way the current through each lamp, and hence its brightness, could be varied at will to a great nicety by sliding the contacts. A great convenience of the arrangement lay in the fact that neither lamps nor photometer head had to be moved.

The darkest of the coloured films was placed over one side of the photometer, the colour to be graded down to it on the other; and this was then covered with a piece of photographic opacity. By sliding the contact of one lamp across the neutral position in gradually decreasing oscillations, this neutral point was found with a moderate accuracy. Then the tints and opacity were removed; and if the white lights were found to be adjusted to equality, then the opacity was considered the correct one with which to grade down the tint. Working in this manner, all the colours were graded to a nominal equality. This when completed formed the test object. A really orthochromatic combination of filter and plate should render it as a series of equal opacities.

The next point was to select a suitable mixture of orthochromatising dyes, and to this end the following series of mixtures of pinacyanol and pinachrome were tried:—5 c.c. to 0 c.c., 4 c.c. to 1 c.c., 3 c.c. to 2 c.c., 2 c.c. to 3 c.c., 1 c.c. to

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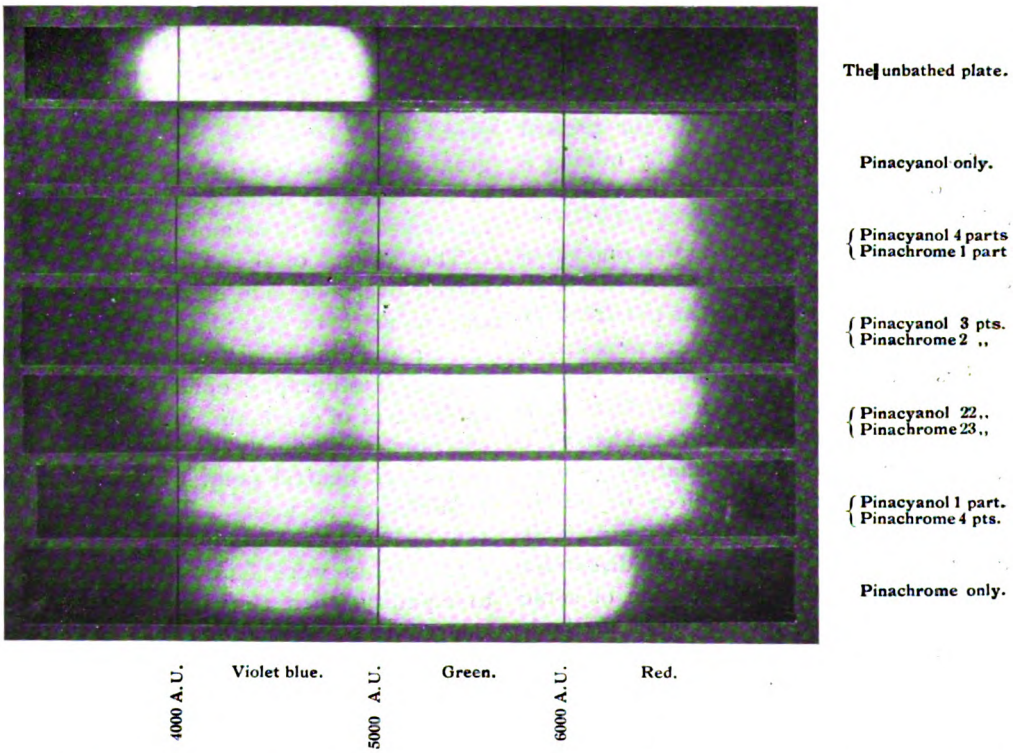
4 c.c., and 0 c.c. to 5 c.c. In each case the 5 c.c. of 1 in 1000 stock solution were diluted with 250 c.c. of water, rendered faintly alkaline with ammonia. This formed the solution for bathing the plates.

A slow photographic plate was used and several were bathed in each mixture for three minutes, washed for three minutes, and then dried in boxes containing fused calcium chloride. The plates were then tried with the sensitometer, while to follow the sensitiveness conferred by the bathing, an exposure to a spectrum of white light was also made. The sensitometer was illuminated by the light from a pair of open-type arc lamps reflected from white blotting-paper; and in order to subdue the effect of the blue light, a filter containing 10 mgr. per c.c. of filter yellow K in a 1 cm. cell was placed in front of the camera.

The spectrum test was made to a grating spectrum; and so that that light might be fairly constant and not contain too much blue, a gas mantle was used. The exposures to the spectrum were all for three minutes on one lighting of the mantle, and all the conditions as regards temperature, time of development, etc., were kept as constant as possible.

These latter tests bring out some interesting points. The depression of the normal blue sensitiveness, which

PHOTOGRAPHS OF THE SPECTRUM OF WHITE LIGHT ON BATHED PLATES.



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occurs when the plate is rendered sensitive to red and green light, is well seen. It would also appear from this test that the pinacyanol actually produces a better *red* sensitiveness when it is mixed with the other dye. The mixture selected by the sensitometer tests was not that which had the greatest red extension but the one containing pinacyanol 1 and pinachrome 4.

The adjustment of the filter then became a matter of trial and error, based on the previous absorption tests of a number of dyes. The final result arrived at for the best orthochromatic rendering under open arc illumination was on a plate bathed in a mixture of pinacyanol and pinachrome in the ratio of 1 : 4, when this was screened by a filter containing filter-yellow K mgr. per c.c., and fast green blue shade mgr. per c.c., and used in a cell 1 cm. across.

The New Service: The Anglo Engraving Co. Ltd. at Milford House.

We are unlearning a good many lessons. Or perhaps it might be said that we have some new experiences which are only old experiences grown older. Every truth seems to have in it the half of a lie, or at any rate the possibility of misunderstanding. Happily the whirligigs of time bring in—corrections.

One of the plausible mistakings which I have encountered has been the notion that any business intimately concerned with the swift supply from hour to hour of needed, popular, inexpensive products such as process blocks must itself bear all the marks of haste, of makeshift, of litter, and even of confusion. But worse than that—the idea seems to be that if the product sells for a small price, the business producing it ought to have "straits" and "struggles" written large all over it. It seems still to be thought that there must in the fitness of things be a certain consonance, a "keeping" between a low price quotable by a business, and a low, apologetic sort of business habitat.

Which being done into simpler terms has meant that as half-tone and line and even colour plates seem now to be produced almost for trifling pence, the workshops of the producing engravers, it is thought, must bear all the marks of that depreciation, and look mean—mean in all connotations, architectural, clerical, mechanical, even managerial.

For impressing quite a different concept of what is fitting, and of what may be the legitimate aim and desire of every process engraver, of the new time, rendering the New Service, I can think of nothing better than a visit to Milford House—Milford House, Milford Lane, E.C., to be more precise. Milford House, however, seems the sufficient address. Renovated, and greatly improved by the addition this year, at the south end, of a large area of window lights, it is henceforth entirely occupied through its whole long stretch from north to south by the Anglo Engraving Company Ltd. In equipping it for their large and important business they have transformed it side to side and end to end. And the transformation has been wholly along the line of respect for the craft, of determination to house it worthily, of selection of the best in all plant and all "appointments," and at the same time of quiet, simple dignity and restraint.

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Metal-printing Room.

You pass through a fine entrance (noting the mosaic paving as you do so) and enter the office. It is long and may even seem narrow, but that is because of the length. It extends practically the length of the block. Being admitted beyond the counter, you pass towards the south end, with the desks of the staff on your right and various rooms opening out of the oak-panelled partition on the left. The desks are all of walnut, and all of the same make. The effort has been made in all departments to standardise the equipment. In the filing system, for instance, one notes against each desk one of the metal filing cabinets which have commended themselves to many commercial houses by reason of their strength, their economy of space, their suggestion of safety. The desks are of the kind which in response to a lever reveal an unsuspected typewriting machine which has been duly protected from dust as well as kept out of sight, and which is ready for the instant touch.

The first of the rooms on the left is a comfortable waiting-room. The next is reserved for the systematic classification and storage of specimens. The next is

Mounting Room as it appeared when finished.

the room of the managing director. You will search this room in vain, I imagine, for anything which can well be dispensed with. It holds the fewest things one can well imagine, as forming the serviceable equipment of the private room of a chief with the affairs of a staff nearly two hundred strong resting largely upon his shoulders. Just the usual good desk; three, not more, of the finest carved oak chairs you can imagine, and upon the mantelpiece, if you please, a Billiken. Shall we call it a kind of mascot, to bring luck, or to ensure continuance of the good fortune which has attended this always growing business through its fourteen

Mounting Room ten days before moving in.

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years? Add that the walls are handsomely oak-panelled.

Stay: there is one thing more to tell—that there are telephones *and* telephones. Intercommunicating telephones which do not intercommunicate—or do not serve you instantly, which is much the same thing—are a mere vexation of spirit.

over various floors at Farringdon Avenue. The difference has regard to the efficiency and permanence of the apparatus. A bad telephoning system makes very serious deductions in its frequent "contrary moments" from the convenience and time-saving of its good-tempered intervals.

Mr. Noel Hunter's room is appropriately

Portion of the Studio.

Going into a new place was an opportunity to apply the general "Anglo Company" rule and adopt "the best," in reliance that, as always, the best is the cheapest. Never till the arrival of this opportunity of entering into the new quarters had the managing director such perfect and quick facility for speaking to any and every one of his numerous departments, from his desk, though to be sure there was 'phoning next to the managing director's, and its appointments have the same note of fine quality of fittings and fine restraint.

We pass into the office again *en route* for the packing department, which is on the same floor. Traversing thus a few yards of the office floor, we obtain once more the swift impression which all is planned to convey of airy and well-lit spaciousness and of standardisation.

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The chairs as well as the desks are all alike, and are good enough for the British Museum reading-room. The office clock is synchronised with all clocks in the establishment. An automatic bell, too, rings at the lunch hour, and I've no doubt (though this I am not told) would get quite excited and ring its heart out if it should chance that a job was a few minutes behind its schedule in its race with time.

The studio is distinguished from others I have seen, first of all by the long line of cameras all mounted on iron frames. Skeleton-like the fabrics seem, despite that the barrels are of 2-inch width. There is no travelling gear (for lamps) fixed to the ceiling; there are simply right-angled projections at the top of the upright standards at the copyboard end.

The arcs might impose too much strain upon these right-angled projections, but this is guarded against by a very simple device. There is a vertical bar of about eight or ten inches in height upstanding upon this arm at a point about a third of the distance from its angle with the upright standard. A stout wire stretching from the point where the projecting right angle arm outreaches, is led to the top of this short upright piece and thence to the extremity of the arm. In its miniature it is reminiscent of a suspension bridge.

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Thus strengthened, the arm is very rigid, and it can move up and down or to either side.

All but two of the cameras are new, and the whole aspect is very alluring. I don't say but that even the best of plant has to be studied and coaxed a bit to ensure the perfect execution of its tasks; for machines of highly developed mechanism seem to be almost human things in their occasional kinks. Every new works or newly equipped works wants a few days to get into its stride, so to say. It may have taken even the "Anglo" a week.

The lighting in the main studio is all by the enclosed arcs of the Westminster Engineering Company of Willesden; but mercury light is adopted in a chapel-of-ease studio specially constructed by the new occupiers for dry-plate work.

By the way, I note in passing the convenient room for "enlarging" work, opening out of this topmost studio.

It will be necessary for the operators in this top studio to keep thoroughly fit. No Daniel Lambert redivivus, with his thirty stone substantiality, will be an acceptable applicant for any work in this quarter whatever his photographic skill. For the way into that studio is up a spiral stair, and not a broad one at that—perfectly adequate, though involving nothing more serious than the temptation to joke those who use it.

A double-page camera specially built for the Anglo Engraving Company by Messrs. Hunters Ltd. is one of the valued possessions of these studios. (It may fit in here to mention that Messrs. Hunters Ltd., the process suppliers and engineers, are not in any way related to those directors of the Anglo Engraving Company who have the same cognomen.)

The windows of the dark rooms can be opened at any time, and the facility for changing the air when no work is at the moment proceeding at that quarter must be of very great benefit from the point of health.

We pass down the teak wood staircase, which has been made in full compliance with County Council requirements, and enter the etching-room. We might have entered this by a staircase at the other end of this long building. Levy etching machines for copper plates are here at work, and hard by are Mark Smith etchers. I see two of them operated by one motor placed between them. One large Levy is busy upon zinc plates for line work. The different mordants which are appropriate for copper and zinc respectively are of course perchloride of iron for the copper and nitric acid for the zinc.

It is very unusual in an etching-room to see two or three finishing machines. But it seems quite in the fitness of things here. In the first place, the room is so large that a few machines of this sort in a corner are, in common phrase, neither here nor there. Secondly, and more important, the air seems quite free from any unpleasantness such as of old time has been incidental to all rooms with hand-rocked baths (I do not note a single hand-rocked bath on the premises). The moment a plate is etched it can be taken at once to the routers and bevellers upon this same floor. Avoidance of petty waste of time is the great reliance of the "Anglo." What has not to be paid for has not to be recovered from a customer before his work yields a profit. It is worth while to pause here a moment for the stressing of what is really the chief aspect of this Company's removal.

The taking of these large and handsome premises, which has undoubtedly cost a considerable sum, has been a well-con-

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sidered spending of money in order to save money.

The principal finishing room is in the basement, a place very much better lit than the name might imply. By the way, we show in two contrasted views the basement as it appeared at two dates, just fifteen days separated from each other. It was not American hustling. As a British engraver told his American friends when he was visiting the States: "We don't hustle in London; *we haven't time.*" Here plenty of the familiar machines were at work, although my call occurred only a few days after the entry into the new premises. A little detail may interest: there is provision in the pressure cylinder employed for working the aerograph brush for keeping the pressure to 40 lbs. or in its close region. When this figure is reached a laterally moving metal finger shifts the belt from one section of the split pulley to the other. All engraving artists will appreciate the value of such uniformity of pressure. There is, too, a clever little nailing machine for fixing the plates on the blocks which, so far, I only remember to have seen in one other engraving house in the Metropolis.

The removal was a week-end affair, and the aim was to be ready on the Monday. Hard work was put in at Farringdon Avenue all through Friday night to get everything ready.

The packing and despatching departments are amply housed, and with fine lighting.

I have attempted nothing like detailed description, but have simply recorded a few impressions of a stroll through the works. It should be added that Milford House is open to receive engraving orders from 8 A.M. till midnight. It should further be added that these are only some of the works of the Company. Its colour works and studios are situate at Kingston Road, Raynes Park, Wimbledon. There are Glasgow works at 10 Bothwell Street in that city, and a Manchester office at 13 York Street in Cottonopolis. Even this, I believe, does not embrace all the art plate-making activities of the firm.

But that is another story. Q.

THE "DAILY EXPRESS" publishes the first reproduction of the card inviting privileged guests to Westminster Abbey for the Coronation. The card, which measures $13\frac{1}{2} \times 14\frac{1}{4}$ inches, is much larger than that used at the Coronation of King Edward. It is the work of Mr. Bernard Partridge, and has been engraved by the Swan Electric Engraving Company.

A VERY able address on the polarisation of light has been delivered by Mr. A. W. Brackett in the Great Hall, Tunbridge Wells. It was featured by many illustrative experiments, and was followed with great interest. Mr. Brackett is an ex-President of the Auctioneers' Institute, and, we understand, is a member of the Tunbridge Wells Photographic Society. We shall revert to this lecture.

THE extra cost entailed by the shortening of the week in electrotyping foundries in the Metropolis (a shortening from 54 to 50 hours), has naturally led to much careful review of the whole position. A slight advance in certain electrotyping prices seems inevitable under the circumstances.

Original plate-makers have also good ground for a slight advance of rates, since they have long ago conceded a short week.

VERY good colour plates, about twelve in number, are the great feature of a new "Guide to Tunbridge Wells," or the Royal Tunbridge Wells, as that town is now permitted to style itself, compiled, engraved, and issued (this month) by the Photochrom Company Ltd. This company has for years had an important factory in the Wells. The monochrome page views number over thirty, and there are many special "tail-pieces" or other illustrative adornments. The size is about 5×7 inches, the 5 inches being the width of the page. The work is issued under the auspices of the Tunbridge Wells Corporation. A one-time resident in the Wells, Mr. Frank Colebrook, has supplied the literary matter.

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Interdependence in Process: How Plates, Papers, Pressures and Pigments affect each Other.

By ***Harry A. Maddox****, Paper-making Silver Medallist* 1909.

CLAY-COATED PAPER STILL BEST FOR BEST WORK—FOUR FACTORS—THE RATIONALES OF ETCHING—OF INK DRYING—OF DOUBLE TONE—OF OFFSET—WHAT IS OFFSET, ESSENTIALLY—ITS WEAKNESS AND STRENGTH.

(*Concluded.*)

DOUBLE-TONE inks are now largely used by the higher class printers, with a view to securing the most artistic effects from half-tone blocks. Briefly stated, the principle of double-tone inks consists in the admixture of a second tint or colour, along with the necessary colour pigment. The former consists of a coal-tar colour, which on drying after the impression is taken, develops a slight halo round the dots primarily formed. According to the solids and various tones, the intensity of the development regulates itself, so that without effort the correct toning is ultimately acquired. As the whole process is thus dependent upon the relative degree of absorbency of the stock, it follows that the results will vary in effect according to the nature of the paper. A set of examples printed on a S.C. paper and an art stock shows such difference in tone that the use of the same ink on both classes of paper would not be surmised without a previous knowledge of the fact. The micrograph clearly proves that the intensified development of the halo, or spreading of the auxiliary tone, is the prime factor in the varying effects. As this bi-tone effect is not apparent until the ink actually dries completely, it is evident that conclusions as to the ultimate appearance on any variety of stock cannot be drawn until a considerable period after the impression has been taken. A second point is that the drying is best performed away from a strong light.

To compare now the work of the offset press in half-tone with modern letterpress production. Coated paper is unnecessary, therefore a great advantage is immediately secured. Photomechanical processes have suffered somewhat in the past from the fact that the ultimate work was produced upon non-permanent paper—in fact, upon paper which is exceedingly short-lived. Already the capabilities of the offset press in half-tone and other photomechanical processes have been well proven by the production of high-class work, with excellent effect, upon the roughest-textured stock. The rubber blanket, which itself receives the reversed impression from the rotary plate upon which the transfer lies, is of a resilient nature and will readily yield (to a degree, however, not detrimental to the work) to the obstructions of fibre and interstice. The exigencies of the copper plates under ordinary conditions create the necessity for a perfectly plane surface. On the other hand, the rubber blanket of the offset calls for no special character in the paper, and will without effort print upon any surface from a coated to a coarse linen crash.

The micrograph shown in my article in the April issue shows a half-tone impression by offset upon a rough bond

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paper, which forms as severe a test of capacity as could well be imagined.

A Drawback to Offset.

The greatest drawback to offset half-tone printing is the transferring, for if a perfect impression, containing the necessary life, is not forthcoming, no amount of effort will create a correct result. With the development of special processes for obtaining transfers in reverse we may look to a considerable progress in the offset method of reproducing half-tone pictures. The effect is much softer than can be attained from flat-bed letterpress machines, the rigid impression of which often results in grey centred dots, with ink squeezed to the outer ring. The even film of ink, more full-bodied and stiffer than previously permissible, contributes to the success of offset-printing. In a commercial sense, greater advantages by far than the superiority of artistic effect are conferred by the cheapness of duplication and increased rate of speed, for the machine in capable hands steadily maintains an average of 2000–5000 per hour according to the nature of the reproduction.

There are many difficulties to be overcome, however, before the success of this method is finally proved so far as half-tone work is concerned. The amount of letterpress matter which usually accompanies half-tone plates, especially in catalogue work, decides the method, and up to now the great majority of such orders are executed on art paper on flat-bed machines. Nevertheless, the fact that an easily workable and genuine method has now arrived which is capable of displacing the deleterious art paper is sufficient evidence that progress will be made along the lines already intimated, which may in the end result in the abolition of such a false and unreliable product.

The micro-photos which have accompanied this article are all of the same magnification, 35 to 40 diameters, excepting the double-tone microgram, which is magnified one hundred times. They have been so arranged as to show, not only the microscopic appearance of the dots, but also the fibrous character of the paper. Consequently the sharpness of the dots has had to suffer to a slight degree, in order to facilitate the introduction of the fibre. A comparison may thus be made of the manner in which projecting fibres and receding interstices are likely to obstruct the reproduction of the dots as effected by letterpress methods with unyielding agents.

(Microgram taken at the Manchester School of Technology—paper-making department.)

A new Engraving Firm.—With the advent of Spring there buds yet another process house trading under the style or firm of Imperial Engravers Ltd., at 60 Poland Street, London, W. In estimating the likelihood of its blossoming forth and bearing good fruit, it has to be remembered that the principals concerned therein are men of long and exceptional experience. One of them is Mr. Charles R. Fogwell. He was for over twenty years associated with the Meisenbach Co. Ltd. and Carl Hentschel Ltd., and for about eleven years he was manager of Meisenbach Ltd. During the past twelve months he has been in the United States, gathering information and ideas as to process and its allies, especially in regard to half-tone transfers for offset work. Mr. James Fox, another of the principals, was for many years in charge of the artists' department at the Meisenbach Co. Ltd.; since then he has for a few years been controlling the Dorland Studio. His work in advertisement designing and in commercial art work generally is well known. The third principal is Mr. C. N. Boroughs, who served an apprenticeship with the Meisenbach Co. Ltd., and since then has had wide experience in London and in the provinces, and has held positions of responsibility. We understand that all the employees have been selected with the intent of getting the very best men for each particular department.

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A Dual Royle Exhibit.

Stepping into a pair of "breaches."

In British printerdom we are familiar with the name of Jardine of Nottingham. It stands for makers of platen machines in particular. But in Nottingham's staple industry it stands still more notably for the manufacture of machinery devoted to lace and other textile productions. Similarly in the United States and in Great Britain the name Royle is widely and reputably known in engraving connection. Royle routers, Royle bevellers, machines various, we owe to them; and a great debt it is. But in America, particularly in Paterson, New Jersey, a great silk manufacturing centre, the Lyons of the States, "Royle" also stands for eminence in machinery for silk manufacture. Recently an exhibition was held in Paterson. Naturally the Royle Company put up a very strong exhibit. This included a machine for duplicating the packs of pattern cards used in Jacquard weaving, and a circular loom for weaving hose. Part of the stand was occupied with the Royle machinery for photo-engraving.

This must have been quite interesting to those who are monotonously making money in the silk world, instead of enjoying the exciting sport of defending the last cent, in process. They knew that Royle had stepped into the breach so far as silk craft was concerned; they now found that Royle had done the like in another case; that Royle had stepped into a pair of breaches. They learnt the great service Mr. Vernon Royle of this company rendered the plate-making world

A glimpse of an Exhibition at Paterson, New Jersey, at which John Royle & Sons were large exhibitors.

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when he devised a routing tool which should make revolutions, if need be, fifteen thousand times in one minute; in that eclipsing the best record of the most lively South American State. Some of these cutters are only of one-sixty-fourth of an inch at the cutting end. This radial arm router, fitted with its fine and subtle tool, seems to be like the human arm in ease of movement, while its cutter is incomparably more potent in ease and effectiveness than hand or fingers can even be imagined as being. This tiny point can go anywhere —into the most acute angles. It is process work which has called forth the router as we know it. The old time router used in the making of wood letter was a very different thing.

The Royle Company were especially thanked for the very great service which their important exhibit rendered to the Paterson Exhibition—an exhibition, we may say, primarily designed to evidence the advanced state of the art of weaving in the United States. This is emphatically a case in which a prophet is honoured in his own country. Messrs. Penrose & Co., of 109 Farringdon Road, the sole agents in Great Britain for Royle machinery, are to be linked with Messrs. Royle in congratulations upon this exhibition, and the honour it won.

Preparing Negatives for Reproduction Work.

By Walter Griggs.

Apologia — Start right — Different purposes, different densities — Glycerine and water — "Scraping" through—Alcohol and pumice—Matt varnishing — Retouching implements—Hints in working — The kind portrait retoucher — Landscape — Antiques — Work for the press — Pace needed—The L.C.C. "Preparation of Originals" Class.

A FEW suggestions regarding the preparation of negatives for reproduction work will, I hope, be of interest and of service to some workers in the varied crafts comprehended in the purview of this journal. As the writer is more versed in performing the practical work of reproduction than in writing about it, he bespeaks the tolerance of the reader. He hopes, too, that he will be forgiven for very direct entry upon his subject. It is a reassurance to him to remember all the time that he is writing for practical men. To them he commends his notes and observations, in the hope that they will welcome them, not certainly as constituting a treatise on the subject, but as perhaps amounting to data and material for assisting the reader's judgment in the matters treated. With this apologia he enters on his task.

The negative (and positive or carbon transparency) should be carefully examined by the retoucher for its printing qualities, tones and values, lights and shades. Its final perfection in all these respects must be added by the retoucher, where necessity is manifest. At the same time it is but poor business to rely on trying to transform a negative bad in its own creation. Faulty doctored negatives can give no final satisfaction.

The first condition of good work is fitness, suitability for the process. And in regard to this fitness it may be premised that varying degrees of density in the negative are necessary for varying purposes, such as portraiture, exhibition work, photomechanical processes, press

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work—to name a few varieties. No one rule applies to all, any more than one developer will suit all plates.

Diluted developers weaken their action; strong developers and lengthened time of development give greater contrast.

When taking exteriors (the usual photographic value) all the colours of the landscape may commonly be correctly gauged if viewed through a blue filter. If not satisfactory, a yellow filter should be used or an orthochromatic plate.

The negative for monotone or colour should be soft and full of gradation and character, and grey in appearance by transmitted light.

Chemical reduction and intensification (when these agencies must be employed) precede all retouching. Local treatment with ferrocyanide of potash and hypo is less likely to spread on the wet surface of the film if glycerine is mixed with the water. At this stage a P.O.P. print should be taken; so that, with another print taken after subsequent work, a comparison may be afforded as to the success or otherwise of the retouching.

With a sharp knife held firmly at right angles to the film, scrape and pare downwards in one direction only, and proceed to make the alterations necessary; reducing, it may be, the size of a waist, correcting ill-fitting clothes, scraping down and lightening draperies too dense for the light to penetrate. If necessary, sketch and scrape-in additions to the figure or background as desired. The film must not on any account be cut through to the glass; the touch should be light and firm. A useful knife is such as used by the lithographic and photogravure artist. A needle with the thick end fitted to a wooden holder is suitable for fine work such as removing black spots from the film, darkening and strengthening eyelashes, etc. Dense portions and halation may be reduced with pure alcohol to which fine powder such as sifted pumice may be added, the parts being gently rubbed with soft rag. In many instances this effectively replaces knife work. The progress must be carefully watched as it advances. If it should be overdone, tint can be replaced and detail inserted by means of the pencil, stump, and brush.

The glass side of the negative should now be matt varnished and the film side gently rubbed over with retouching medium, the smallest quantity that can be employed; this rubbing over the surface being done in a circular manner with fine soft rag.

To matt varnish a negative the glass should be carefully cleaned and slightly warmed—just sufficiently to expel damp. The varnish should be poured in a pool at the top right end, flowing to the top left and bottom left, and drained finally at the lower right corner. This to be successful should be carried out quickly and steadily. In cases where necessary the varnish can be applied in the same manner to the film side also.

With negatives of fine detail the pencil works more delicately when neither medium or matt varnish is used.

The retouching desk and necessary materials are sable hair brushes, water-colour paints, indian ink, pumice powder, hard and soft lead pencils (and fine emery cloth to obtain fine points), stumps and blacklead powder, knives and the needles fitted to holders. It is advisable to purchase the retouching desk at a photographic dealer's. You should have a frame hinged to a foundation board which can be adjusted to any required angle. In the opening is fitted a sheet of frosted glass, on which the negative rests. The top and sides are curtained round to shut off

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all extraneous light. Daylight or artificial light illumines the negative. The hand when working should not touch the film, but should rest on an adjustable support capable of being moved as required, or on a piece of fine card.

Commence by removing any small black spots or other defects with the needle, retouching transparent spots with the finest sable brush and water-colour paint that closely matches the tone of the negative. This must be applied with great care, not to exceed the size of the defect. If an excess is put on, remove it at once with blotting-paper before it dries. Practice will overcome all difficulties in this connection. Level all uneven and patchy portions, most frequently met with when the negative has been taken from a coloured original. These would otherwise show in the proof as dark and incorrect. In such cases paint over the matt varnish on the glass side (on the portions only where it is necessary)—painting tints of water-colour of the requisite strength, matched to the colour of the film. This will bring them into harmony with the rest of the subject, detail being given by removing the matt varnish from parts with the needle or knife, and pencilling on the film side. A P.O.P. print taken at this stage for reference is advisable.

Proceed now with confidence to model, paying due attention to light and shade in accordance with the established rules of those factors. The work put on some subjects may be more vigorous than on other subjects, but add no work that is not well defined and technically correct, or character and individuality will be sacrificed.

The pencilling should be done in short fine lines worked closely together, in diamond-shaped cross-hatch, the intervening spaces being afterwards filled in, and in a circular manner. The pencil should be worked round in fine circles which resemble slipper-work on the finished print. No definite rule for placing lights and shades can be given, as much depends on the circumstances under which the negative was taken. Retouching commences at the highest lights and proceeds by degrees through the varying shades to the greatest depth. Thus in portraiture one softens the shadows on the face, neck, and shoulders, keeping the lights on the upper part of the forehead and well rounded over the brows, and in a thin line along the bridge of the nose, the upper parts of the cheeks, lower lip, and chin—all less intense in the lower part of the face.

In landscape, in variety of foliage, in cloud effect, or in seascape, one should express the power of wind on the moving water, or other elements; and study reflected lights and atmosphere.

Antiques and MSS. call for special treatment, relieving and softening the deep tones of old and faded colours, while reverently preserving the aspect of age.

The retoucher who takes his own negatives will find in work for the press a source of considerable profit. With scientific apparatus and information of current events, he can find a large market for his prints, its value no doubt depending on the merit of the subject. In this class of work the quality of the negatives and prints is often inferior, as they are most frequently taken under great disadvantages. Developing and the resultant bromide print quickly follow, and here the knowledge of rapid retouching and technical "building up" are the controlling power in use of the pencil for high-lights, the scraper for deep shadows, and the air-brush and a few touches of black and white water-colour—and in an incredibly

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short time the bromide is on its way to the engraver.

In this latter connection the "Preparation of Originals" Class of the L.C.C. School of Photo-Engraving and Lithography gives instruction of the highest value in the acquisition of this special knowledge — training students in "black and white" drawing for the finest photo-mechanical work, photo-engraving, photogravure and collotype.

Negatives come from all sources; clients in many cases supplying them. It will not do to specialise too exclusively; the "all-round" man is always in request.

Great value attaches to having a portfolio for reference, about 15 x 12, with good examples of every range of subject—photographs, photogravures, colour prints, combined in the latter instance when possible with their monotone reproductions.

These examples should be of the highest class. They should include models for light and shade and design to which the retoucher can turn for guidance when in doubt over technical details.

The scope is very wide. Pictures can be built up on the "negative" foundation with equal certainty as on paper. As a vehicle of expression the negative is of the highest value if the artistic sense is available and is exercised. The retouching should be carried out in such a manner that the eye of the observer is directed to the lesson the artist wishes to convey. The brightest light should be where the attention is centred, while giving due regard to all other portions.

The commercial value of retouching depends necessarily on ability and speed. Trained and skilful artists have excellent opportunities.

Process Plant Replanted: A Stroll through Messrs. Hunters' New Premises.

MESSRS. HUNTERS LTD. have just moved twenty yards and a thousand miles. The postman will tell you that they are in the same street, that Poppin's Court, where they were lately domiciled, was a short by-way off St. Bride Street, and that they are in St. Bride Street now, at Nos. 16 and 18. But the staff will tell you that they are "up another street altogether." They will say that there is an enormous difference between being squeezed into three floors, or two floors and part of a third (with a bit of chapel-of-ease accommodation elsewhere), and being provided with seven fine floors wide spaced and amply lit, and all to serve for show-rooms or stock rooms or offices, while actual manufacture is amply housed in another building across a City passage. There is, too, a thousand miles, in point of convenience, separating the old restriction of having to take in all machinery through a front entrance, and the new freedom of wide openings at the sides of the premises where powerful cranes can swing in this and that, while the front office, like an innocent right hand, does not know what the side office doeth.

Our representative walked through the new premises the other day for a preliminary look round and was much impressed with the complete and elaborate arrangements which have been made to cope with the all-round increase in the firm's business. Here it will be possible greatly to increase the bulk of the stock

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and yet leave enough show-room space to exhibit the more important items of machinery, the sale of which Messrs. Hunters control, as well as a full range of process cameras, apparatus and equipment which they manufacture.

At a time when the volume of business is greater than ever before, however, the housing of a miscellaneous stock comprising over 2000 different articles ranging from the proverbial needle (engraving) to art printing machines is no light task. We propose, therefore, to postpone our detailed description of the firm's various specialities until our next issue, when we shall have had an opportunity of seeing the show-rooms, etc., in their completed state. In the meantime the internal facilities call for remark.

A separate town order department on the ground floor forms a convenient means of dealing with the steady stream of messengers who call for small items "over the counter." Messrs. Hunters found by experience that half a dozen little "printers' devils," more or less bespattered with evidence of their calling, and dividing their attention while waiting for goods between cheap literature and sweetmeats, did not improve the atmosphere or appearance of the old general office—hence the decision to make a separate department for this class of business.

Intercommunicating telephones are provided all over the premises with wise profusion.

There is a double-lift system; any machine for the show-room is taken into the goods entrance in Harp Alley (for the premises have St. Bride Street and Harp Alley frontages) and into the lift, and is straightway taken into a room where it is stripped and cleaned; and so upstairs again into the show-room. There is, we may say, a sub-ground floor; so precious is space and so special the nomenclature of City premises.

A Keith & Blackman furnace and radiator system guarantee the due heating of the premises. The heat on any floor can be nicely controlled.

For some time Messrs. Hunters Ltd. have specialised on electrical work of all descriptions, and the wiring of their new premises is a model of what such an installation should be. Only screwed barrel has been used both for power and lighting, a somewhat expensive system, but one which minimises the risk of fire. The oxidised silver electroliers lend their own dignity to the show-rooms and offices.

(*To be continued.*)

About Amphitype: The Process Fully Explained.

MR. HENRY L. SHAWCROSS, the inventor of the process known as Amphitype, gave an explanation of this method with demonstration at the Hanover Hotel, Liverpool, at the April meeting of the Liverpool Printers' Managers' and Overseers' Association. The address dealt fully with the technique of the subject, which was described (as reported in *The British and Colonial Printer*) as a very perfect process of photo-lithographic transfer, possessing certain advantages in ready prepared materials, in "keeping"

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qualities, in simplicity and efficiency of manipulative details and in results.

Amphitype is a means of impressing on stone or metal through a photo-transfer, developed on a ready sensitised photo-transfer paper, anything that can be photographed in a camera, into a line or grained or stippled negative. It is put forward as suiting line work and larger grained stipple work especially well. As to the sensitising, it will be seen that bichromates appear not to be used at all.

Good-bye Chromate!

Ferric salt takes the place of the bichromate, and solution of ferrocyanide takes the place of the water bath. It is claimed that whereas a bichromate film would be unfit for use in a couple of days, ferric salt films will keep good for ever.

Mr. Shawcross in his lecture showed transfer impressions just as the ink copy had transferred to the metal without any subsequent treatment. "Not a line is missing," he said; "no spreading has taken place—whilst the ink is present in such body as to afford ample scope in the subsequent treatment of the plate in preparing for printing." He also showed samples of minute details which he claimed to be exceedingly good, and said the plates were transferred by a student who had not touched zinc work previous to this year. The impressions were as good for all ordinary commercial purposes, he contended, as if obtained by direct photo-printing on to plates. The impressions obtained when on metal would serve for either surface printing or for etching up into type blocks (obviously we have here the explanation of the name Amphitype).

Poitevin—with a Difference.

The lecturer reminded the meeting that for sixty to seventy years printers had relied on the bichromates, but Poitevin, though he so long ago introduced bichromated gelatine photolitho transfer methods, also pointed out that iron salts could be used for a similar purpose. Poitevin, however, confined attention to water as a solvent, and that only to the parts of the film where light had acted. Thus he could only produce positive copies of translucencies. Mr. Shawcross said he used water solution of ferrocyanide of potash as a solvent of the unexposed parts of the film, thus producing negative copies of photo transparencies and bringing the iron salt method more into line with recent photolitho practice. He produced a soluble photo sensitive gelatine film on paper, that so hardened under the action of light that it would not yield to certain solvents. The fact that water solution of ferrocyanide of potash would combine with a ferric salt of iron to produce a Prussian blue, and also that a soluble Prussian blue could be so produced, had long been known; but the facts had only been made use of for the production of positive blue line copies of engineers' tracings by the Pellet or cyanofer blue line copying process. No one had reflected that the formation of the soluble Prussian blue would extend itself to the colloid film. But the lecturer had applied this to produce positive pictures from negative translucencies in pigment, and applied it more particularly in litho transfer inks for photo transfer purposes. It had taken years to mature these methods, but they could now be acquired in a single lesson by any intelligent novice. No poisonous substance entered into the composition of the paper.

Dipping Tests.

Mr. Shawcross showed a piece of ready sensitised Amphitype paper which had

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not been exposed to light; he dipped it into a bath of ferrocyanide of potash; it instantly turned blue. He showed another piece which had been exposed to light, and in which the ferric salt was consequently altered. He dipped that in the same bath; no change took place. He immersed a piece half of which had been exposed to light; the demarcation line stood out distinctly.

If he inserted Amphitype paper beneath a process negative in an exposure frame and exposed to light, the portions on which the light acted became impervious to ferrocyanide. On the print so exposed being dipped into ferrocyanide developer the picture stood out in white on blue. That blue ground, the gelatine of which it was composed, was rendered soft and soluble. If he then took another print which after such exposure under a negative he had carefully inked with Amphitype litho transfer ink and immersed it in the ferrocyanide bath, gently warmed, the picture would begin to show up through the ink; gentle rubbing with cotton-wool would reveal it in litho transfer ink lines on a light blue ground. He finished development by rubbing on this zinc plate held over the bath, and he immersed in water bath to stop over-developing or undercutting. He blotted to remove running moisture which would otherwise make piebald bluish stains. These transfers seemed best if used fresh, but still they seemed to have no time limit.

Transfers a year old had gone down as well as fresh ones—because the ink picture was carried on top of a thin gelatine film fixed with iron, which had an iron grip which would only yield to certain treatment. That treatment which he adopted proceeded on the observation that the iron salt was decomposed; the gelatine was converted into a soap and softened and the ink, however old and dry it might seem, was released from the paper to attach itself bodily to stone or metal.

(*To be continued.*)

Facings and Pacings.

By "Ion."

It is up to the electrotyper—at any rate it very largely rests with him—to determine whether Messrs. David Allen's remarkable developments in half-tone plate-making shall have their full fruition. Perhaps Messrs. Allen themselves may hardly have realised that they can get plates of 26 inches or so duplicated. The other dimension can be far greater; I believe 26 inches is at the moment the limit, one way, for lead moulding.

It is up to the duplicate man to instal a larger hydraulic directly he is reasonably assured of a demand. But, of course, it is up to the engraver to give him reasonable assurance that his outlay will be rewarded.

As to what Messrs. Allen are actually doing, I may say I have seen a 38 × 50 inches four-colour print, the subject being a woman's face and neck. A 32 × 20 inches three colour of an exhibition (a bird's-eye view) was effective, though less striking, naturally, than the four-colour.

A 51 × 37-inch half-tone was a very pleasing bit of railway scenery near London, sand bank and masses of foliage showing abundant detail, serving the double purpose of beguiling traffic for the railway company, who were the customers, and strikingly instancing what Allen's can do.

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A 58 x 38-inch line block showed curtains on a blue ground. This was quite successful, but not so happy in subject nor so good an instance of the adaptability of the relief-printing method.

So I would say, at any rate, simply surveying the print; I have not closely examined comparative costs in the case—letterpress and litho.

My favourite in the lot is the monochrome railway view.

There should be good business for the electrotyper when he can duplicate plates like these.

I have examined some fine electro originals. Well, that's what I feel like calling them. They were electros sure enough, but the surface was the characteristic dark enamel face of the copper half-tone original, and they were shells, innocent of any alloy metal, but with strong copper substance. It was lead moulding which gave the surface its unusual colour.

The Reproduction of Pen Drawings.

A PEN drawing that is suitable for satisfactory reproduction as a line block should be opaque black ink on white Bristol board. Unfortunately it is not always possible to persuade artists that this is necessary, or they do not care to give up the convenience of using their favourite tools and materials. Some artists, for example, always make line sketches with a fountain pen or a stylo, and though their sketches may not be primarily so intended, they are sometimes required to be reproduced.

It is not possible to use Indian ink in a fountain pen, because such an ink is a mere mixture of insoluble carbon in liquid, and ultimately some of it settles and clogs the pen.

It occurred to the writer that it might be possible to use Indian ink in a stylo pen, and by courtesy of Messrs. De la Rue & Co. he was supplied with a number of their "Express" stylos, which were tried with every brand of artist's black ink on the market. The pens and all inks work well at first, but the orifice gets choked as soon as the pen is laid aside for a short while, and then must be cleaned out with the small needle supplied with the pens.

If this trouble is not objected to, then an opaque ink can always be used, but it is doubtful if the average artist is so keen on saving the engraver trouble that he will incur the bother of cleaning his pen so frequently, so that until a truly soluble ink is produced that will give an opaque black we cannot hope easily to reproduce sketches made with fountain or stylo pens.

The Study of Technical Photography: A Forward Movement.

A NEW class in technical photography (limited to twenty students) intended for instruction in catalogue work of all kinds, was started on April 26th by the L.C.C. School of Photo-Engraving. The classes will continue on Wednesday evenings till the end of June.

In order to give students practice in the use of daylight, visits will be made on Saturday afternoons to an art gallery, a museum, a workshop to photograph

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machinery, to Kew Gardens for horticultural work, to Hampton Court and other places for architectural interest. The fees are 3s. 6d. and 2s. 6d. for outsiders; the classes are free to present students of the School, and also to learners, apprentices, and improvers in the trade under twenty-one. From the syllabus which we append it will be seen what a comprehensive study can be made of the subject.

Syllabus.—The qualifications necessary to succeed in this branch of photography. The different forms of cameras and the use of the various movements. The use of lenses of different foci and their application. Choosing a lens: what to consider. Testing for different defects. Exposure by artificial light, daylight, flashlight. Methods of calculating exposure. The different sensitive surfaces for receiving the image. Wet plate, collodion emulsion, dry plates, process, ordinary, rapid, and ultra-rapid plates. Colour-sensitive plates: the use of backing. Developing. Different developers and the reason for employing the various chemicals. Factors to consider when developing. The after-treatment of the negative by chemical and mechanical means. Stripping, etc. A consideration of the printing methods employed and the suitability of different kinds. P.O.P. printing; toning by separate and combined methods; self-toning papers. Bromide and gaslight printing, and the quick production of prints for process reproduction. Platinotype printing, carbon printing, etc. Photography for catalogue illustration: points to consider. Furniture, hosiery, lace, china, metal work, embroidery, etc. Copying methods. Old documents: faded originals. The intelligent use of orthochromatic and coloured filters, and the plate to employ in conjunction with them. Advanced students can receive instruction in micro-photography and autochrome work.

My Causerie.

THE French printing trade press is calling attention to the possible use of nickel sheets of a particular kind in lieu of paper for certain classes of printing. I understand that some interesting experiments have been made. It is always well to remember that paper is not necessarily the last word in printable substances, and hard pressure is not necessarily the last word in type contact. Moreover, paper can hardly fail to rise in price.

I have had a great time during Easter with the *Life of Sir Walter Scott* by his son-in-law Lockhart; and it chanced that I turned to it from encountering a report of protestation against high ritual in the English Church. From a twofold consideration it was rather a chuckling find to light on the question put to Sir Walter Scott by Hogg, the Ettrick Shepherd and poet, who was thinking, Burns-like, of launching a few of his poems on the world: "I wish likewise to know if you think a graven image on the first leaf is any recommendation."

I see some future advt., "Skrene, Netch & Co., makers of graven images by half-tone, line and colour processes."

In the same work there's rather a pitiful story about Dr. Thomas Young, described as "illustrious for inventive genius." The story continues: A northern critic, whoever he was, had treated with every contempt certain discoveries in natural philosophy and the mechanical arts, more especially that of the undulatory theory of light which ultimately conferred on Young's name one of its highest distinctions. Young had for some time lectured at the Royal Institution, and having determined to publish his lectures, he had received from one of the booksellers (publishers) the offer of £1000 for the copyright.

He was actually preparing for the press when the publisher came to him and told him that the ridicule thrown by the *Edinburgh Review* on some papers of his in the *Philosophical Transactions* had so frightened the whole trade that he must request to be released from his bargain.

So for daring to think differently from Sir Isaac Newton (so I read the matter), the man on whose teaching all the modern science of three-colour half-tone is based, suffered this monstrous loss. "I am sorry for the pitiful catastrophe of Dr. Young's publication," wrote Sir Walter Scott, always the most sympathetic and chivalrous of spirits. . . . "One must always regret so serious a result of a diatribe. . . . Reviewers ought often to read over the fable of the boys and the frogs, and remember it is much more easy to destroy than to build."

How it would have sickened Sir Isaac himself. He may have been attached to his now discarded emission theory as distinct from the wave theory of light, but he was more attached to freedom of investigation.

To turn to a very different theme—the in-

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equality of fire insurance premium rates in studios of the metropolis. I have in mind one engraving works on a large scale where the rate is 4s. 6d. per cent. I know another not so very far away where the rate is £1 1s. The disparity seems monstrous. The heavy rate falls upon a sound but by no means wealthy firm. To be sure, I can well understand some special charge being made in the particular case, for the works wherein these engraved images are produced are on an upper floor of a building occupied by several firms; and it happens that it would not be particularly easy for the firemen to obtain instant command of a serious fire breaking out in the rear of the premises.

The fire insuring office seems to have argued that if a bad fire broke out at or near this engraving studio the whole block, housing some scores of firms, would probably go. I have personally known that block particularly well for a good many years now, and have only known of one fire there occurring, and that was very quickly mastered.

F. COLEBROOK.

A 17th-century advertisement appearing in *The History of Illustration*, and reproduced by Messrs. Carl Hentschel Ltd. in their pamphlet "The Value of Illustration."

Index of Current Literature.

Process Work for April contains articles on "Bookkeeping for Process Workers," "Novel Way of producing Modelled Relief Blocks," "Reproducing Three-colour by Three-colour," and "Astigmatism caused by Mirror."

Le Procédé's current number contains articles on "Dufay Screen Plates," "Photographic Bas-reliefs for Embossing," "A New Overlay Method," "Notes on Enamel Printing" and "On the use of Casein for an Acid Resist."

The British Journal of Photography of March 31st deals with the business side of photo-engraving. In its April 7th issue it treats of "Litho Reproduction of Plans" and "Bromoil on Metal"; and, April 24th, on "The Problem of Three-colour without Hand Work."

Printing Art for March treats of "Some Limitations of Engraving" and "The Value of Illustrations."

The Graphic Arts has the best current supplement illustrations showing what is possible in modern reproduction work.

The Platemakers' Criterion has a lucid article on "The Mertens Process," and both that journal and *The Engraver and Electrotyper* deal at length with the business side of photo-engraving, but from very different aspects.

"Three-colour Blocks in the Making" is discussed by Mr. Robert Vincent, controlling head of the Amalgamated Press (Harmsworth journals) engraving department, in *The British and Colonial Printer* of April 20th.

"Mertens Photogravure" is the subject of correspondence relating to a previous article on the subject in the same journal of April 20th.

A rotary photogravure print of some distinction appears as frontispiece to the April *American Printer*. It is by the Rotary Photogravure Company, Passaic, New Jersey, U.S.A. It is apparently the first put out in this way by that company.

Other contents of the April number of *The American Printer* include "How an Electrotype is Made" (fully illustrated), "Advertising and Art," "Colour in Catalogue Illustration," "Educate the Customer" (reprint), "A Good Zinc Etching Fluid," and "Half-tone Printing on Bond Paper." Photo-engravers' Conferences at Chicago, Cincinnati, and Birmingham (Alabama). All these conferences deal with the price problem.

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School Notes.

THE "Course" boys of the L.C.C. School of Engraving visited *Lloyd's Weekly News* on Thursday, April 27th.

ON April 10th a special performance was given by Sir H. Beerbohm Tree of *Henry VIII.* to the scholars from L.C.C. schools. Among the number were seven of the day boys from the School of Photo-Engraving and Lithography.

AT the Exhibition of the Royal Photographic Society at the Prince's Skating Club, Knightsbridge, from May 9th to May 31st, there will be an exhibit prepared by the L.C.C. School of Photo-Engraving, showing all the recent developments in process work, including three-colour rotary photogravure, three-colour offset, and bromoil applied to photo-lithography.

INSTITUTE OF RESEARCH IN MUNICH.—The *Photographic Journal* for March gives the following particulars of the "New Institute for Instruction and Research in Photography, Chemigraphy, Collotype and Engraving," to be opened on May 9th in Munich:—"The new building has altogether ninety rooms in basement, ground, first and second floors and an outbuilding; the most noteworthy being five portrait studios in the wing, two copying studios in the front building; seven dark rooms, partly fitted with so-called labyrinth entrances; four enlarging rooms, two positive workrooms of entirely new design, three daylight copying or printing rooms for collotype and copperplate printing; four rooms for the section of judicial photography, accommodation for experimental work and testing of materials, including a room for sensitometry and microphotography; three rooms for Röntgen-ray work, a large exhibition room; a lecture hall for about a hundred students, a large drawing hall, and many others. Towards its cost the Bavarian Government authorities have contributed £70,000, while the Institute itself has provided £1000 for the new technical arrangements.

"The addresses at the opening ceremony will be delivered by Herr Franz Grainer, President of the South German Photographic Society, and by Professor Emmerich. As is well said by the *Photographic Journal*: 'Munich has always occupied a high position in connection with the culture of the pictorial and graphic arts, and the endowment of this new Institute is a further proof of the interest taken in their progress and practical application in this ancient city, already made famous in the annals of photographic processes of reproduction by the names of the Alberts, Obernetter, Meisenbach and Hanfstaengl, and in photographic optics by the Steinheils.'"

Brevities.

THE Printing and Allied Trades' Football Charity Cup was this year won by André & Sleigh's Football Club. A photograph of the team appears in *The British and Colonial Printer and Stationer* of April 13th.

A MOVING STORY.—On April 1st to the heart of Cleveland, the business of the Eclipse Electro and Engraving Co. was removed to 2041 East 3rd Street. The decision to move was only made in February, at which time the building was far from completed, but Frank H. Clark and his associates "got a move on," and by the end of March a model plant was installed in a model factory. There are several little points:—

Compressed air is distributed to every point—available for running the air-brush, dusting the inside of camera or plate-holder, sweeping sawdust from a mounting-bench, or drying a negative rapidly.

A store is provided with a storekeeper responsible for never being out of stock of anything. Each department or each independent operator will draw his estimated requirements for the day, each morning; reporting any surplus from the day before, as a part of the supply toward the current day. It is estimated that the saving of telephoning, special messengers, "hurry" orders, and occasional waits will pay for the storekeeper, and that smooth running will be greatly facilitated.

A heavy lead floor underlies the Levy acid blast machine for zinc etching and has its edges well turned up, so that even the spilling of a

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whole carboy of acid within the space would not affect the surrounding wooden flooring.

Removable dark rooms, of corrugated iron, heavily enamelled, are installed. They can be moved to "larger and more commodious premises," or to some other part of the present building, if necessary, without the loss that accompanies the tearing-down of wooden partitions. The enamelled surface collects little dust, and is easily and regularly washed down.

Individual finishing-benches are provided for the electrotyping, so that the man who may be doing delicate work on one cut will not be disturbed by one who may be pounding on another, as is the case when one long bench is used.

A dished bed of concrete with an ample gulley-way to the sewer underlies all the depositing-baths, so that in the event of a catastrophe, even at night or when no one was present, the liquids would take care of themselves.

Many other points there are, to some of which we hope to refer, with illustrations, when the place has shaken down into full running.

A 1910 PATENT FOR AUTOMATIC ETCHING OF HALF-TONE INTAGLIO.—According to a patent (No. 23,861, 1910) of Dr. Eduard Mertens, 60 Freiau Strasse, Freiburg, Germany, protection is granted for an improved process of preparing printing surfaces for deep intaglio etching, in which, after the usual preparation and preliminary etch, a resist is rolled on, and the surface is again etched. This process is repeated with accumulating quantities of resist until, first, the finer spaces and, successively, the wider interstices are filled in, and so protected against the etching fluid. The patentee first refers to the customary method employed, in which, after the preliminary etching, it is usual to protect the unattacked parts of the picture by covering with grease, dusting over with asphalt, and melting the same together before the deep etching. After this covering with grease and asphalt, the deep etching takes place (both for high relief as also for intaglio printing) as far as requisite to give the depth necessary for the printing; or the etching is interrupted one or more times and the coating and fusing with asphalt repeated, taking care, however, to leave without a coating all the points or lines which are to be deepened for the printing, so that, after rolling-in, the metal remains visible. In special cases it is necessary to cover certain parts of the picture independently by means of a brush.

The new method is the subject of notice by a writer in the *British Journal of Photography*, who says it is distinguished from the methods previously known, especially by the feature that immediately after the preliminary etching (on rolling-in) the fine points or lines in the highest lights are not kept open, but are entirely or almost entirely closed by the rolling-in, in order to obtain the lightest tones on the printing in consequence of the very slight etching of these respective points or lines. This closing up of the points or lines is gradually increased so that finally only the parts of the picture which appear quite dark on the printing are further deepened by the etching; whereas, on the contrary, in the processes hitherto used with the aid of rolling-in methods (that is, for etchings effected without coating by means of a brush) it was the endeavour of the operator to obtain all over equal depth, or as nearly equal as possible, and this was carried as far as the maintenance of the points and lines which were endangered by broad or under-etching would allow.

It is thus claimed for the new method that it possesses the great advantage that the special preparation for etching effected by hand coating can be entirely dispensed with, and that the original, which was only subdivided into minute parts by the half-tone reproduction, but was otherwise reproduced in unaltered form, can be reproduced by etching without correcting by hand labour—that is to say, can be reproduced mechanically by more or less frequent rolling-in, in its respective original form and beauty, so that the etching can be effected more certainly and cheaply by mechanical means than by the method of coating by the brush, which depends upon the skill of the workmen.

THE AXEL HOLMSTROEM ETCHING MACHINE (English manufacture).—We have had the opportunity of seeing work executed by this etching machine in the workshop of Messrs. C. Janzer & Co., 4 and 5 Gough Square, London, E.C. One thing it did was to cut in a minute or two a name scraped upon a metal sheet, etching to a depth of from one-sixteenth to one-twelfth of an inch with perfectly clean edges, the work suggesting that label cutting by process engravers about which something in the way of suggestion has lately been said. It was undoubtedly a strong and fine piece of machine-etching. This etcher is built entirely in earthenware. Components and contributories to its make and modus are its earthenware paddle, its fan and cooling chimney, its vulcanite cover, its air mixer, its slightly sloping support whereupon the plate is placed, and its simple driving arrange-

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ment. Its ventilation tube may be of pasteboard or wood, but must not be nailed by iron nails, as the condensing acid fumes which return into the machine would corrode the nails and adulterate the bath.

The machines are made as follows: "Experiment" for plates up to $11\frac{3}{4} \times 15\frac{3}{4}$, wanting one-sixth horse-power to drive; "Mignon" for plates up to $19\frac{1}{2} \times 19\frac{1}{2}$, driven by one-third horse-power; and the "Sirius" for plates up to $21\frac{1}{2} \times 25\frac{1}{2}$, driven by half horse-power. Electric speed regulators determine the speed of the paddle wheel—for the two larger sizes from 400 to 700 revolutions per minute, and for the smallest size from 600 to 900 per minute. It is important to see that the knife and the paddle wheel are entirely level. You underlay the bath at the four corners with felts, as may be needed for this levelling purpose. The strength of the acid used up through etching line work on zinc should be reinforced by adding one-third of a litre to one litre of concentrated nitric acid once or twice a day. For albumen copies on zinc the solution should have 3 to 5 Beaumé; for enamelled copies on zinc, 8 to 12 Beaumé; for enamelled copies in half tone or copper or brass or zinc 25 to 35 Beaumé; the revolutions in the latter two cases being 550 to 700 for the larger sizes, and 750 to 900 for the "Experiment" size. For line-etching the solution should have 15 Beaumé, and the paddle wheel should not make more than 400 to 450 revolutions in the larger sizes and 600 in the "Experiment" size. As a generalisation the makers point out that too hard-looking results indicate too many revolutions and perhaps too weak etching fluid. A too grey result indicates too strong acid. The high-light points must not be etched too sharply. The aim, indeed, is to keep the points as large as possible in the high-lights.

"CASSELL'S CYCLOPÆDIA OF PHOTOGRAPHY," which is being completed in twelve fortnightly parts, is a very valuable publication. It is edited by Mr. Bernard E. Jones, editor of *Work*. Its twelve parts are illustrated by twenty-four full-page plates in colour and half-tone, and by hundreds of line drawings in the text. The contributors include Messrs. George E. Brown, F.I.C., editor of the *British Journal of Photography*; Arthur D. Godbold, who deals with Studio Work; William Gamble (Photo-mechanical Processes); Edgar Clifton, F.R.P.S. (Lenses); T. Thorne Baker, F.C.S. (Isochromatic Work); H. W. Bennett, F.R.P.S. (Architectural Photography, Carbon Process, Lantern Slides, etc.); A. H. Blake, M.A. (Night Photography); T. Browne (Stereoscopic Photography); C. P. Butler, F.R.A.S. (Astronomical Photography); D. Butt, F.R.P.S. (Studio Design and Construction); F. M. Duncombe, F.R.P.S. (Natural History Photography); W. Kilbey, F.R.P.S. (Focal Plane Shutter Work); A. Lockett (Cameras); T. Manly, F.R.P.S. (Ozotype); Percy Salmon, F.R.P.S. (Historic and General Processes, Developers, and Miscellaneous); E. J. Wall, F.R.P.S. (Chemistry, Colour Photography, and Special Processes); and W. L. F. Wastell, F.R.P.S. (Pictorial Photography). Mr. Gamble, Mr. Salmon, Mr. Wall, and Mr. Lockett have read the whole of the proofs.

We deal at length elsewhere with Amphitype, and it may be interesting to embody a short paragraph respecting amphitype in this Cyclopædia. It will be an index to the Cyclopædia's scale and method:—

"Amphitype is also the name of a photo-lithographic transfer process invented by Mr. W. H. Shawcross of Liverpool. The paper is sensitised with an iron salt, and keeps indefinitely. It is printed under a negative, then inked all over with a special ink, and developed with a solution of yellow prussiate of potash. The lines of the prints are thus covered with transfer ink while the ground is a deep blue, which, however, can be bleached away in a solution of common soda. The transfers are applied to zinc or stone in the usual way."

NEW SIZE IN MARK SMITH ETCHER.—In response to a demand of the trade, Messrs. Hunters Ltd. are now constructing the "Mark Smith" etching machine in a new and larger size. The new size is made both as a single or double machine for either zinc or copper, accommodating plates up to 18 × 26 inches. Owing to the exceptional size of the machine, the paddles, instead of being placed crosswise at one end of the bath, are placed parallel with the longest side. The machine being 18 × 26 inches, the paddles are 26 inches long. One of these new machines has already been installed in the engraving department of the *Daily Sketch* office, London, where there are already two "Mark Smith" machines in operation. It is interesting to note also that the Manchester office of the *Daily Sketch* has installed a "Mark Smith" machine.

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Estab. Jan. 1894.
"The Process Photogram."

THE PROCESS ENGRAVER'S MONTHLY

Vol. XVIII. No. 210.
JUNE 1911.

AND ELECTROTYPER'S AND STEREOTYPER'S REVIEW

Some Notes of the Month.

ENGRAVING history has not lacked incident of late weeks. First and foremost has been the extra amount of work traceable to the Coronation. Some engravers have become art publishers for the nonce who did not publish before, and much better work has issued *ad hoc* than was apparent when King Edward was crowned. The more ambitious illustrated journals have been rising to the occasion; and so have some engravers who foresaw a market in portrait blocks of various sizes and with various ornamental commendations. Then trade in general is brisker, and that must have reacted favourably upon the engraver. As for the duplicate worker, he has settled down fairly well to the new and shorter week. We mean that he is considering the chief ways and means for making the best of the altered conditions instead of weakly wringing his hands at the thought that conditions have altered.

The time has seemed favourable for new ventures, and it is not surprising that we hear of a new art journal, which is very shortly to appear, and is to be very ambitious in its colour-plate work. In one department of colour work we find a small flotation. Messrs. Bruce, Frey & Co. of London issue a prospectus offering shares to £2500 to the public, and particularly to fine print vendors; the purpose being to extend the distribution of prints made by the Frey screenless photolithographic process; to enable the shareholders to enjoy a profit heretofore largely intercepted by art distributing wholesalers, and incidentally to confirm the custom of maintaining certain selling prices and refusing to cheapen good prints by jobbing off any "remainder." We believe the new company contemplate considerable use of the offset method under the very finest conditions of that modern but deeply interesting and suggestive practice. Apropos, the month has seen the issue of the Bendixson-Widdop patent, which is concerned with both rotary intaglio work and litho printing. The full specification is set forth in this journal.

We publish on p. 163 questions which this year were set in the Ordinary and Honours Grade of the photo-engraving examinations conducted by the City and Guilds of London Institute. Let us attach the note hereanent that it would be lamentable if the ordinary activities of the L.C.C. School of Engraving were to be very seriously affected this year by the building operations and the temporary lodgment of the School in Fleet Lane. A fillip to what may be called the extra curriculum work has been given by a singularly suggestive address delivered by Dr. Mees, which more or less made a present to all who crowded

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the room of the fruits of months of special research touching the phenomena and the problems of photographic development.

Another happening of the month has been the holding of the Royal Photographic Society's Exhibition at Knightsbridge. Several engravers made displays of their work; and fine collotype and strong and quite beautiful rotary photogravure by new-comers into the field were some notable features. Mertens' newspaper photogravure, by the way, is apparently to get a little help forward through improvements in the scraper adjustments.

The Copyright Bill continues to receive somewhat bewildered attention. A conference at the Photographic Exhibition passed a strong resolution urging on Mr. Buxton that the photographer was being placed by this Bill in an inferior position as regards copyright to that which he occupied before the Bill was brought in; and protesting the urgency of remedying this state of things. If a man who creates a drawing obtains copyright in it which is to extend fifty years after his death, why should not the creator of some rare and perhaps artistically beautiful completed negative also have the like protection? The advisability of so long a term is another matter. Whatever the term, there should be fair and consistent dealing with producers.

"Prospecting" in Process: A New Intaglio Suggestion.

By Harold Hood, F.R.P.S. (Managing Director of Messrs. Hood & Co. Ltd., Middlesbro').

If you were to ask any of the well-known engravers you happened to think of, you would probably find them admitting that "process" as it is, is hardly likely to be maintained for very many decades. Yet how many of these well-known engravers are themselves preparing to modify the direction of process engraving?

It has always struck me, since my earliest associations with business, that a serious link is missing in the organisation of very many engraving studios and printing factories. It has seemed to me that no factory of any size, small or great, in our particular industry should be considered complete until it has arrangements made, either for setting apart a certain portion of each week (or each month, if it be a *very* small concern) for pure research and experiment, quite apart from the question of whether such experiments will "pay" within one year or five years.

Some of the larger concerns might well have one or two rooms definitely set aside for experimental work, with a definitely appointed experimental staff. Given a conscientious worker, I hope it is not too optimistic to say that the labours of even one man, with a boy assistant, if judiciously directed by a member of the firm, should, with reasonably good organisation and a little luck, repay the outlay a hundredfold.

If one devotes much attention to the important matter of patent news to which nearly every trade paper of standing devotes a more or less obscure corner of its columns, and if the statement is also

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borne in mind that not even one-twentieth of the patents either applied for or completed are ever carried to the haven of successful trade applications—if these things are considered, it must be borne home to the thinking person what a tragic undercurrent of lost labour is here represented!

PATENT TRAGEDIES.

A goodly proportion of these patents are, without doubt, the outcome of properly organised research departments and "model shops," but there is a real pathos when one considers the futility of the efforts and the hopelessness of the position of the many individual inventors, simply because they are not associated with, or have not the confidence of, some trade concern, ready to provide the necessary room and appliances for perfecting what might prove to be inventions or improvements of the utmost commercial value.

Can anyone think of a firm offhand who has done more effective spade work than Messrs. Wratten & Wainwright in the direction of colour analysis and the provision of remarkable tools, in the way of colour-sensitive plates, of a sensitiveness and reliability at one time not dreamt of?

It is almost two years now since in a well-remembered visit to Dr. Kenneth Mees, well known, of course, as the moving spirit of the above-named firm, we discussed this very subject with enthusiasm. It is probable that Dr. Mees enjoys the distinction of having attached, as an integral part of the Wratten & Wainwright organisation, a larger and better equipped research laboratory than many larger firms can boast; and this laboratory, moreover, is constantly engaged in dealing with research work as well as the usual tests appertaining to a dry-plate factory.

Dr. Mees seemed to think it rather shortsighted on the part of many well-known firms that they set so little value on, or at any rate apparently undertook so little, properly organised research. As to the process trade, it may be that as I do not know to a certainty the inner workings of other engraving houses, I may be mistaken in assuming that no regularly organised experimental work is done. However, I have a conviction that my impression is right—that there is really very little being done in evolving new methods or improving old ones.

"PLEASANT"—THURSDAY—"EVENINGS."

Apart altogether from the question of whether the thing pays or not, I can from actual experience give assurance that experimental work becomes really fascinating. For a good period, ending unfortunately four or five years since, I used regularly to set apart Thursday nights for informal discussion with one or other of our workers of certain inventions or ideas, and for experiment in evolving them to more practical stages. The flesh, however, gradually proved less energetic than the spirit, and various circumstances —chief among which were overtime and an increased pressure of daily business— have caused the practice to fall through, though the researches (if one may dignify such experiments by such an appellation) are to be continued in another form, and under less tiring conditions.

Those readers interested in my suggestion of a "Research Room" as a supplemental "attaché" to photo-engraving or photogravure, collotype, or photo-litho studios, should remember that, generally speaking, it is more profitable to improve present processes than to invent entirely new ones. That is to say, it is not so easy to create a demand for a new style as to

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cause an increased demand for a well-known style of illustrations. It is elementary economics to assert that you cause increased demand by the ability to supply the same quality of illustration—(despatch, organisation and "service" generally being equal)--at a lower price than your competitors. It amounts to the same thing, that you can, at any rate, divert the demand so as to stream in your direction, if you can supply better illustrations at current prices.

Therefore, as factory-workshop practice soon tends to get rutted both in its methods and the style of its finished product, let us have a Research Room to infuse new blood and vigour into both methods and product.

Even a matter of three or four hours set aside for such purposes per fortnight would leave any business the better for its influence, though possibly three or four hours should be regarded as the minimum.

Now I cannot do better than indicate just one or two directions in which investigation and experiment might be continued —either until proved futile or successful. These small ideas are original so far as I am concerned, though I ought not to be surprised to find them patented. If in after years any reader has attained affluence through the instrumentality of these mere germs of ideas, and, at the time of making his will, wishes for my address, I have no doubt the editor of *The Process Monthly* will oblige the affluent one and his moderately old friend the writer.

Ante-offset: Half-tone on Rough Surface.

Prior to the time of the rubber-offset process for paper prints I encountered many a demand for impressions from half-tone blocks on rough ivory cards, or on cards of "eggshell" surfaced ivory. Much wasteful experiment proved such a printing surface impossibly unsympathetic to the copper half-tone block under normal conditions. The sequence of ideas suggested a crushing impression for the shadows, to flatten down all the hard-sized roughnesses of surface. An ordinary paper interlay was regarded as of no use, because the rough surface must be compressed at *all* the shadows and eased off at *all* the high-lights, including small lights among shadows. So I made copper half-tones with a half-tone print both at front *and back* of each plate, both sides being etched together, the etching, however, being prolonged enough to remove the high-lights of the under-image.

The Cutter-out Cut Out!

This, on thin metal, gave distinctly improved results with charming "made-ready" results from "straight" machine pulls; but it did not do what I desired with the rough ivory, though even here the results were perhaps less ugly than before. Moreover, I found myself cut out and my idea improved upon in one well-known direction and the precise idea patented in detail in another direction, and therefore dropped the matter altogether.

But in attempting to deal with this matter of printing on hard surfaces I noticed that in printing on rough surfaces (whether hard or soft) one obtained the same result of flatness of tones as when printing on smooth or glazed surfaces, if these latter were hard-sized. The cause of this seems to involve the principle which makes the Woodburytype process possible, that is, that when "short" or slippery ink is printed on a hard-sized or slippery surface, the impression (of the individual half-tone dots) is lightest where the pressure is greatest.

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So natural and all-prevailing is this "slip" in half-tone printing that it can only be minimised sufficiently for fine illustration purposes by an unnatural "coated" or, at worst, soft-sized paper. But take a strong Coddington magnifying glass or a microscope and examine a good-looking half-tone print on coated paper or otherwise. Unless the make-ready has been remarkably well adjusted to give just absolutely the correct pressure, the "pin-point" dots, instead of appearing as minute black discs of uniform intensity (as they should) are in most cases likely to show as rings of black, with pale grey centres. The ink has slipped from the centre off the edges all round.

Then look in the same way at the shadows. There, the "white" holes in the half-tone block are really the blackest parts of the shadows. The ink has slipped off the smooth part into the cups, whence it is picked out, intaglio fashion, by the great pressure.

WHY NOT A FENCE?

But when you come to deal with rough or hard papers this defect is exaggerated, and here is my suggestion as a line of investigation. Why not build a "fence" round each dot, and so make your half-tone block also an intaglio or photo-gravure one?

I have thought of this for so many years, but found so many other urgent things to claim first attention, that, worthless or not, I had better let some other body, with more opportunity than the writer, follow the thing up, should the idea seem worth while.

The "fence" could be built up by electro-deposition, or the equivalent of building a ring-fence to each dot could be attained by filling in all the white spaces or "cups" with a hard acid-resist and cleaning the tops of the dots. The briefest etching would microscopically "cup" the top of every dot and make it more ink-retensive. Hard printing rollers would seem to be necessary, but it was not my intention to suggest details at all, but rather to urge experiment in this and any other new ideas which naturally occur to the observant worker from time to time. New ideas, however sanguine, should be fostered until proved or "laid"—not suppressed. Fifteen years ago wireless telegraphy wasn't even an idea—and now!

What is your Plant costing you?

THIS question is asked by our contemporary *Process Work*, which submits the following:—

Total average Cost per hour Operation.	7 plants, 9 months, 6 cities.	
Photo-engraving.	$	s. d.
(1) Art	1·57	6 6½
(2) Art	1·12	4 8
(3) Art	·93	3 10½
(4) Art	·91	3 9½
Colour camera	2·19	9 1½
Half-tone camera	1·77	7 4½
Line camera	1·70	7 1
Colour etching and finishing	1·37	5 8½
Half-tone etching and finishing	1·32	5 6
Zinc etching	1·41	5 10½
Routing	1·23	5 1½
Blocking	1·11	4 7½
Colour proofing	1·20	5 0
Commercial photo	1·41	5 10½
Electrotype foundry	1·26	5 3

as determined by the Denhamethod cost system, and published in the *Secretary's Bulletin* of the International Association of Photo-engravers of North America.

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Working Process by Daylight.

By R. W. Douglas.

(*Concluded.*)

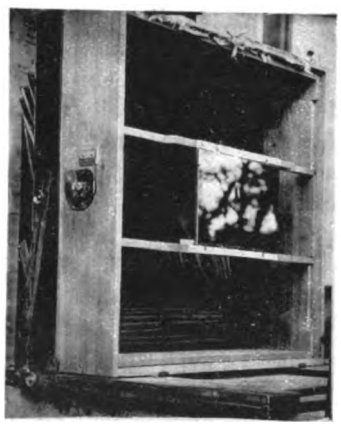
THE lengthy exposures necessary indoors suggested a change to the open air, and at first the variation in the power of the light proved very difficult to gauge. By following the method previously adopted indoors, viz. copying a "line" original full size with the *f*/32 stop, the actinometer and lens being uncapped together, and the latter recapped when the lighter tint was reached, a workable basis was arrived at: four times the "line" exposure under similar conditions regarding size, copy, and power of the light giving that for "half-tone."

The spot chosen for "operating" in was a large yard, so that it was possible to obtain either an exposure by sunlight or shade at will by simply transporting the camera from one spot to another.

In the brightest part of the day the "Process" plate was used, since, being of slower speed than the "Half-tone," there was a better chance of obtaining a good result in the event of error in exposure. Yet so great was the intensity of the light in August, that with the *f*/64 stop in the lens the exposure for "line" at half size was sometimes as low as one second.

When operating in sunlight, a piece of black velvet was necessary behind the sensitive plate, otherwise the reflection from the back of the slide caused the negative to be fogged. Good diffused daylight proved the most satisfactory, and exposures were fairly rapid even with a small stop; as the light became weaker in the afternoon, the "Process" plate gave way to the "Half-tone."

Screen distance was reckoned at first by formula as taught at the L.C.C. School of Photo-Engraving, Mr. A. J. Newton, the Principal, and his courteous staff freely giving advice and suggesting expedients which smoothed many of the initial difficulties. One became used to the apparatus, however, and by using always the same stop in the lens for the "shadows," it became possible to draw up



THE BACK OF THE HOME-MADE CAMERA.
(Block made from screen negative made in this camera.)

a short table of the distances required for each screen, according to the varying extension of the camera.

A round stop, diameter $\frac{1}{8}$ inch, was employed for the shadows, and a larger square stop, cut from card and blackened for the high-lights, where "joining up" was needed. In many cases, if the original was good, only a single stop and exposure were necessary. The stop used in "flashing" was round and $\frac{1}{10}$ inch in diameter.

In developing the half-tones, a magnifier

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was regularly used to watch the appearance and growth of the dots, and also to judge when to stop development: before being placed in an acid "fixing" bath the negatives were well washed. The usual "cutting" and intensification followed.

The illustration of the back of the makeshift camera which accompanies these notes was made from a screen negative taken with the camera itself. It shows fairly completely the main portions of the mechanism, if by such a name it can be called; moreover, it was taken by the writer of these notes after a fortnight's instruction in the methods of screen-negative making, for which allowance should be made. His object in penning these notes, crude and rough though they may be, has been mainly to suggest that the younger members of the craft, who have yet to win their spurs, may gain experience for themselves of the laws that govern the making of screen negatives, which they would find little opportunity for in the studio, and, by bringing thei brains to bear on the many difficulties which surround the subject, supplement the knowledge they have already acquired.

Provision and Prevision: A Look Round the New Hunter Establishment.

I TOLD last month of the removal of Messrs. Hunters Ltd. to the new large premises in St. Bride Street, E.C. What little I was then able to say served as a sort of preliminary canter. I have had the opportunity of a pretty careful survey of the whole of the new premises, and although I could not if I would, and would not if I could, set down full and final detail of everything I saw, a somewhat particularised mention may have interest and value.

The outstanding impression is the variety of the supplies. "Printing is a business of detail," we are often told. Platemaking also is a business of detail. And as Messrs. Hunters' purview comprehends both printing and platemaking, the consciousness of the detail—detail—detail becomes still stronger.

For as one looks over the miscellaneous stock of a printer's supply house, one cannot fail to be impressed with the extent of the field covered by the printing trade. The three main divisions are, of course, photographic reproductions, letterpress, and litho.

Messrs. Hunters cater for all three, and it is surprising to what an extent they overlap. While, therefore, these notes are mainly addressed to those interested in engraving, electrotyping, and stereotyping, I must make references to those supplies for the allied trades which meet the eye in this establishment in every direction.

In the lower basement of the capacious store we see copper and zinc galore; a monster supply for to-day, and a monster supply for days to come—provision and prevision evidenced together. Silver, we are told, was as nothing in days of King Solomon; and copper and zinc have succeeded to that estimation. Just as a Spaniard instantly tells you that his house which you admire is yours, so this stock, if you please, is yours; any amount of it; nothing but that silver which also (see

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Process Showroom.

Solomon) is nothing, being required in exchange. Yours and anybody's; for here surely are sheets for the universe.

We makers and users of blocks think in inches, but the supply house thinks in *cases*; each case containing about 15,000 square inches of copper or zinc.

Then, too, such unconsidered trifles as carbons, negative glass, earthenware troughs, glass baths, porcelain dishes, are here in corresponding profusion.

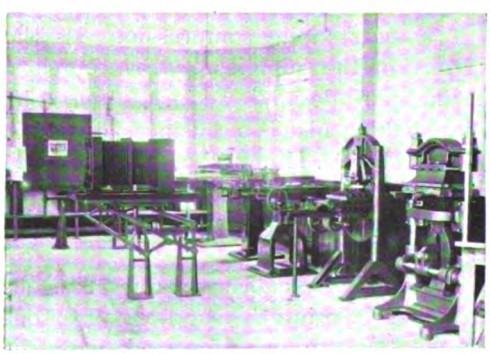
Special arrangements have been made for storing chemicals under suitable conditions of security.

The remainder of the space in this basement is devoted to the storing of machinery, etc., in cases; some being duplicates of those in the showrooms above, others being merely in transit, awaiting the completion of some engraving or other plant before being despatched to their destination.

Proceeding upstairs to the basement proper (a very well-lighted basement, by the way) we find ourselves amid such a wealth of materials that it is impossible to attempt a description in detail. No engraver surely has ever seen so many ruled screens (Hunters Ltd. being British agents for the well-known "Haas" screens), so many shading mediums, or so many Wratten panchromatic plates, while the cylinder blankets, roller coverings, rollers, inks, and transfer papers which can be seen here at a glance are enough to make the lithographer's brain reel. Letterpress sundries are also well represented; with such specialities of the firm as indestructible galleys, wedge-slide composing-sticks and grooved mounts, besides the thousand-and-one odds and ends which go to make up the sum of the printer's content. Surely in no other trade are so many small sundries called for; and it is to their close attention to these small items (on the principle of "taking care of the pence that the pounds may take care of themselves") that Messrs. Hunters attribute their success in bigger things.

On the ground floor of these new St. Bride Street premises there is a handsome showroom devoted to the heavier machines for which Messrs. Hunters are agents. The main items are the new German letterpress cylinder machine, the Corona —which seems certainly destined to make its mark,—the Vacuum Bronzer, and the "Goebel" slitting machines.

Of greater interest, however, to the engraver will be the fine range of platens here on view—the "Pearl," "Golding,"



Corner of Process Showroom.

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Messrs Hunters' New Premises,
16/18 St. Bride Street, Ludgate Circus, E.C.

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THE
JOHN CREPAS
LIBRARY

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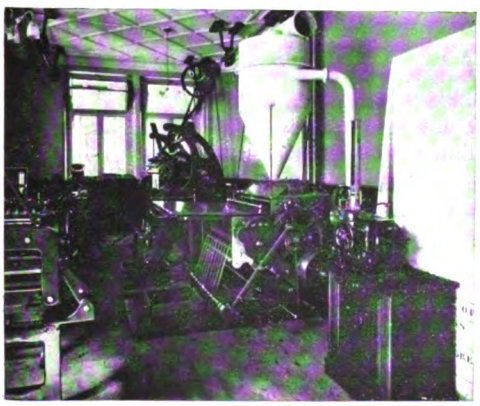
"Rex," and "Brilliant," the sale of which is in the hands of Messrs. Hunters Ltd. exclusively.

The "Brilliant" is exceptionally popular among engravers for proving three-colour blocks. Many of the best firms use it for this purpose. Another interesting range of machinery exhibited here is the "Goebel" machinery for making and printing railway tickets—quite a special study in itself.

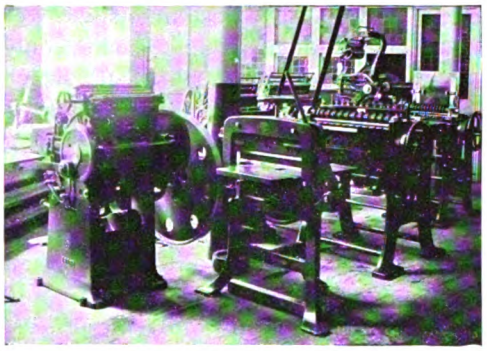
The ground floor showroom is equipped with two lines of shafting driven by separate motors, so that all machines can be shown in operation.

Passing through the handsome general offices on the first floor, one comes to another large showroom on the second floor, which is used for the display of photo-engraving plant and equipment. Here I note the well-known "Arc Gear" type of camera, as well as the less pretentious "line" pattern.

The "All Iron" camera spring stand cannot fail to strike the observer as an advance in the right direction. It is self-contained, inasmuch as the lamps are suspended from uprights which also support the copyboard. It is rigid and non-warping, chiefly because it is constructed of stout iron barrel. Yet it is light in appearance, and it is small; in fact, it effects a considerable saving in floor space.



Ground Floor Showroom.



Ground Floor Showroom.

The "Samson" proof press is another striking speciality which figures in every engraving plant sent out by the firm.

Another feature in every up-to-date "Hunter" engraving plant is the "Mark Smith" etching machine. Arrangements are being made to show the copper and the zinc machines working. These machines have become so much a part of the engraver's equipment that many plants recently installed have not provided for hand rocking at all. We have really had to bury the old wheeze about the hand that rocks the bath ruling the etching room.

A full range of mounting machinery and such accessories as metal guillotines, jig-saws and drills, and compressors for air brushes are on view here.

Next to these we come appropriately enough upon a full assortment of stereotyping machinery, casting boxes, saws, routers, trimmers, planers, and shoot-boards, but detailed description of even the most interesting items is out of the question.

As we proceed to the upper floor we note a useful and handsome cabinet for

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storing electros. It accommodates over 7000 square inches and costs only £4 4s. We note, too, a glass case which contains a very fine selection of lenses, prisms, filters, magnifiers, and similar optical appliances.

For some time Messrs. Hunters Ltd. have given special attention to electrical work, and here on the third floor of their new establishment we find a full range of arc lamps suitable not only for process work but for every conceivable purpose—

Harp Alley—Goods Entrance and Factory.

indoor arcs, outdoor arcs, shadowless arcs, daylight arcs, open type and enclosed type process arcs, all arranged to switch on for demonstration purposes.

Here, also, we have a complete working photo-engraving equipment in connection with the laboratory dark room and experimental rooms. This department is in charge of Mr. Kenneth Hunter, and it is intended that there shall be a continuance and development of testing and experimental work.

On the fourth floor we have ample accommodation for stationery, catalogues, and records.

A description of Messrs. Hunters' new premises, moreover, would not be complete without a reference to the factory premises in Harp Alley.

The wood-working department for camera-making expresses the conclusion the firm reached four or five years ago, that it was useless to rely on being properly served in the matter of camera construction. If the work was right the time might be wrong; if all was finely wrought and promptly, there might have been some misapprehension of orders in some detail. So we gather, and anyhow the firm decided to do its own camera-making. The wood, Cuban and Spanish mahogany and teak and some oak, has been about ten years sawn up before it is brought into this workshop, and here it apparently has a rest of about two years more before being employed in camera construction. The planks do not lie flush on each other. Small slips of wood hold them apart sufficiently for air to circulate through all the time of waiting to be cut up for camera fittings.

The firm use particular kinds of timber for hot climates. Cuba mahogany, harder and closer in grain than that of some other species, is chosen for particular atmospheric conditions.

Noting as we pass that drying racks are made by the thousand, we go on to the polishing and fitting shop. The dust of other quarters is here carefully excluded. This process is easily imagined, and need not detain us. So, leaving this floor, we give one backward glance to conjure up its appearance only a few days earlier, when practically the whole space was covered with iron camera stands. It must have looked impressive.

The metal working department in Harp Alley has been recently very much enlarged. Here, the metal parts of the

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process cameras, the metal stands, and other equipments are manufactured. All kinds of repair work are also going on.

In the engineers' shop, too, one notes the profusion of parts of Golding Jobbers. The firm's agency of these Goldings has been marked by greatly increased sale; and the convenience of rapid supply of any part desired has had, no doubt, a good deal to do with this.

Altogether Messrs. Hunters Ltd. are to be very heartily congratulated upon the very great access of convenience and upon a new power of service. It must be a wonder to themselves, looking back on recent years, that they have been able to execute the business entrusted to them as well as they have done, in the quarters in which they have been comparatively cribbed, cabin'd and confined. The congratulations to Messrs. Hunters imply what may as well also be expressed—congratulations to the whole craft, to whom it is always an advantage that any of its well reputed suppliers and servants shall be rewarded for their work and empowered to render service still more efficient. Q.

The colour illustration of Messrs. Hunters' new premises is from a Lumière Autochrome plate.

A NEW ART COMPANY'S PROSPECTUS.—We have received a prospectus of Bruce, Frey & Company Ltd., with capital £5000, divided into 5000 shares of £1 each. Of the above shares there are offered for subscription 2500 shares of £1 each, payable 2s. 6d. per share on application, 7s. 6d. per share on allotment, and the balance in two instalments of 5s. per share each one month and two months after allotment. The directors are Walter Joseph Bruce, 35 Surrey Street, Strand, London, fine art publisher, and George Henry Bailey, Cranleigh, Bushey Grove Road, Bushey, Herts, accountant; the solicitors are Robbins & Co., 218 Strand, London, W.C.; the auditors, Cleevland, Channon & Snowden, Weavers' Hall, Basinghall Street, E.C., and the secretary and registered office Albert Head, 35 Surrey Street, Strand, London. This Company is formed for the continued publication and distribution, and upon a larger scale, of pictures produced by means of a secret process, and for that purpose to acquire the business of Messrs. J. Bruce & Co., fine art publishers, of 35 Surrey Street, W.C., who have been supplying the wholesale houses, and who have derived considerable profit from such supply.

The actual inventors of the process and printers by the method in question are Messrs. Frey & Sons, of Zürich, from whom Messrs. Bruce & Co. hold the sole agency in this country for sale of the productions of Messrs. Frey & Sons, and exclusive rights in relation to pictures produced by the said process. The company is being formed with the approval of Messrs. Frey & Sons, and the agency and rights will be transferred by Messrs. W. J. Bruce & Co. to the Company.

The supplies have hitherto come to the retailer through the well-known wholesale distributors, Messrs. Beckmann Bros., Ltd., Messrs. C. W. Faulkner & Co. Ltd., Messrs. Marion & Co. Ltd., and Messrs. Winsor & Newton, Ltd. For instance, there were recently printed by Messrs. Frey & Sons, and distributed by Messrs. Bruce & Co., through these wholesale dealers, coloured pictures of Thames shipping scenes, by Charles Dixon; of Bruges and Ghent, subjects by L. Burleigh Bruhl, and a marine subject, "The Ostend Fishermen," by F. J. Aldridge. Over 7000 copies of these subjects were printed, and the entire original edition of each has been sold out by Messrs. W. J. Bruce & Co. Reprints of the Bruges and Aldridge became necessary, and latterly the Charles Dixons are also being reprinted.

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About Amphitype: The Process Fully Explained.

(*Concluded.*)

As we have stated in our May issue Mr. Henry L. Shawcross, the inventor of the process known as Amphitype, gave an explanation of this method, with demonstration, at the Hanover Hotel, Liverpool, at a meeting of the Liverpool Printers' Managers' and Overseers' Association. The address dealt fully with the technique of the subject, which was described as a very perfect process of photo-lithographic transfer, possessing certain advantages in ready prepared materials, in "keeping" qualities, in simplicity and efficiency of manipulative details and in results.

We carried the report last month to the point at which Mr. Shawcross was dealing with transferring, and with the experience that transfers a year old had gone down as well as fresh ones; an experience for which he gave what he deemed the scientific explanation. Continuing his address, Mr. Shawcross said that very different treatment was needed when one was dealing with a thin coating from the treatment when what one had was a thick gelatine bichromate.

There was no more need for navvy work, pulling through and through the press to induce ink to leave a faint impression.

How to test the Exposures.

One could not tell when the Amphitype was sufficiently exposed by scanning. Resource, then, in daylight exposures must be had to an exposure meter or actinometer. He generally used a Penrose zinco meter; a small photo printing frame, the glass case in which was made of obscure glass graduated in tint from clear glass to black density, and numbered accordingly. Printing-out photo paper was inserted in this frame. It was exposed at the same time, to the same light, as the transfer copy one was printing. The more prolonged the action of light, the more would the deeper shaded glass be penetrated and the more would the higher numbers marking that density become visible. He used fresh Imperial P.O.P. He found as a working rule that when No. 5 was clearly visible, and No. 6 just appearing, his Amphitype paper was sufficiently exposed.

Exposure time varied in summer and winter; in summer two minutes' sunshine up to half an hour of diffused light might do; whereas in winter it might take hours. Arc lamp exposures were safest and most certain. Mr. Shawcross spoke of difficulties with inks. He now issued one in liquid form. You poured a few drops on a slab, rolled with a composition roller, and coated the surface of the exposed print with a uniform film of what he called a "comfortable" substance; thinner for stone than for metal. He gently warmed the turpentine out of the print.

"Transferring would remain with the Process Worker."

He thought the litho worker might become his own photo-printer. Surely, as inventor of Amphitype, he had given him facilities with ready sensitised material and methods which reduced photo-transfer to the ease of amateur photography. Negatives could be got from any wet plate photographed to any size one

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desired to work to. One could transfer just as required for repeat orders and release valuable stones. Perhaps craftsmen would prefer to have transfers supplied to them as at present (craftsmen seemed not to be keen on acquiring new methods)—and this transferring would remain the function of the process worker. The litho printer would then only deal with the blue transfer print.

Mr. Shawcross, speaking on the decomposition of iron, said any strong alkali would decompose it and convert the gelatine film into a soap and render it soluble and release the ink. It would do more; it would bleach out the Prussian blue of the ground to a straw yellow. The immersion of the blue Amphitype print into an alkaline bath meant its immediately turning to what was nearly white, and the print standing out well. The picture became tender, and must not be rubbed or the ink coat would be injured. It could not be blotted; it must be air-dried.

THE WHIRLIGIGS OF NO TIME.

The alkaline bath was a weak solution of caustic potash, one and a half drachms to the pint. He introduced salt into the solution, which now tended to form a hard, curdy soap. Frilling was prevented. The salt acted as a restrainer on the potash bath. He used about two drachms of salt; used in excess it hardened the film and the ink would not transfer. He removed the print when penetrated or softened sufficiently, lifting by edges and placing it face upwards in a zinc plate attached to a whirler for brisk whirling. Failing a whirler, one should hang the print by a corner to drip and drain, hanging from a different corner after several minutes. It must dry in the air or be gently warmed till the moisture was driven off, but the print must not be dried right out, or it would not transfer afterwards. It should have such dampness as would result from placing it in a damp book. The print was gently warmed over a heater or near a fire. Blotting could then be used. He then fanned the surface. In transferring, the fewer the pulls that would serve the better; say four, or often two would suffice. The ink should be a little stronger for metal than for stone, and then impressions could be got, available for type blocks. The impression would take dragons' blood for burning to form the resist for the first etch, without any inking up or further preparation.

New Processes by L. Villemaire.

PHOTOGRAPHS DIRECT ON METAL.

We have had the idea of experimenting with a very simple process, which has given results so regular and so perfect that we always use it now in cases of urgency. We believe that it will be called in to render useful services in engraving establishments working for daily journals.

Cut a plate of metal of the required dimensions and cover the sides and the back with acid-resisting varnish without allowing any to get on to the surface of the plate. Prepare the face of the plate as usual, coating it with the sensitive solution of bichromated fish glue. Whirl and dry. Now powder over with talc, and remove the excess with a camel-hair brush.

Now cover over the fish glue with a coating of thin rubber solution, and then proceed with the metal exactly as though it were a glass plate and make the wet

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collodion negative on it, but no prism or mirror is required, as the negative must not be reversed. All that is necessary to do in focussing, screen distance, choice of stops, length of exposure, development, fixation, intensification, and reduction, will be effected without any modification of the habitual methods.

When the negative is thus made, and without waiting to dry it, all that is necessary to do is to expose it to the arc lamp to insolubilise the sensitive coating under the transparent spaces of the negative film. The length of the exposure is generally shorter than by the usual method. To remove the negative film the plate is plunged into benzole, and then the enamel film is developed in water and dyed and burned in as usual.

One sees that as compared with the case of working without the prism one gains the time taken in drying the negative and taken to strip; and working with the prism one gains the time taken to dry. Also by this better contact with the metal a greater sharpness is assumed, and the possibility of approaching much closer to the arc lamp, thus enabling the exposure to be shortened.

REVERSING.

Coat the plate of zinc or copper with a film of sensitive bitumen. After drying, coat with bichromated glue; expose under screen or line negative. After development stain the glue film as strongly as possible in a dye bath, rinse slightly, and dry without baking-in the enamel. The dyed image is then of sufficient intensity to protect the bitumen underneath from insolubilisation, during sufficient exposure to thoroughly insolubilise the bitumen that is exposed. After the second exposure the enamel image is washed away with hot water, and the bitumen film is developed in turpentine as usual. This method gives images that are much sharper than those furnished by the usual reversal process.

GRAIN COLOUR WORK WITH SCREEN DOTS.

Make once for all a set of screen negatives exposed only on white paper, and obtaining a chess board effect; each of the negatives must have the dots running at an angle of 30° from each other so as to avoid a moiré pattern. Now print these dots on metal, coated with fish glue; develop, burn in, and transfer the key to each plate. Paint out necessary parts, just as in the case of plates with a resin grain of shading medium. When such plates are finished they are frequently taken for four-colour half tone.

(Translated from *Le Procédé* of March 1911.)

"Educate the Customer."

BUT DON'T TELL THE SHORT CUTS.

"EVERY successful engraver" (writes George Brigden, secretary International Association of Photo-Engravers of the United States) "knows that he loses money on certain kinds of work. He needs no cost system to tell him. But what does he do to remedy this sad fact? He talks about it, and hopes some day that he can raise his price, or that his competitor will raise his and then they both will make money. This last happy condition will never come. The cheap engraver will always be with us, just as there are cheap hats, cheap shoes, and cheap articles of everything manufactured. What is the remedy? One point which is rarely touched upon

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is the one of educating the buyer of cuts that there is a difference in the manufacturing of good cuts and cheap cuts.

"One of the best points brought out at the Buffalo Convention was the one from Minneapolis, where the cost system showed that a certain line job which came at regular intervals was being done at a loss; and when this fact was explained to the customer he paid the new price, because he said he did not want to see the engraver lose.

"There are many like this customer. All successful business men are honest. And shrewd buyers in any line, if they are getting a perfect article, do not want to bankrupt the concern from whom they buy.

"Do you buy the cheapest hat you can get? When your wife buys a coffee grinder does she not often get one with some theoretical improvement for which she has paid part of the expense account of some good salesman? When you buy chemicals do you buy the cheapest you can get, or do you pay more, and find out by test that it has been cheaper?

"The greatest menace to the craft today is not the lack of knowledge of cost. It is not the closed or the open shop. It is the black mystery of the process and inside conditions which are never explained to the customer. It is the ignorance of the customer that makes him want all his cuts in twenty-four hours. It is the weak backbone of the engraver who won't tell him the reasons why he cannot get out the work at a profit in that time. It is the foolish engraver that will do the work in a rush, if it means that other good work given by trustful men must wait.

"Tell the customer that you can get out one cut in a certain time; but if one hundred customers all want their cuts at the same time, ninety-nine must wait.

"When the customer is unreasonable about delivery, find out if he would give the same service to you if conditions in his business were the same as in yours. When you take him into your confidence and educate him it is not necessary to tell him the short cuts. The short cuts are your own secrets and should be your profit-makers.

"Tell him why you have expert re-etchers. Tell him why you spend so much time tooling your work. Tell him why you lose money by running a special plate small size through your zinc etcher. Tell him the reason and charge him the same as the plumber does to you.

"He will listen, he will think, and he will pay you what you ask in fairness; and he will give you time to complete it at a profit.

"Don't let the printer do the educating. Do it yourself, and while you are educating the customer educate the printer at the same time.

"And while you are doing all these things don't forget your own education. You can learn something every minute."

ORTHOCHROMATIC FILTERS.—Messrs. Wratten & Wainwright have supplemented their former book on the *Photography of Coloured Objects*, which is invaluable to all photo-engravers who deal with colour reproduction, by another book on *Orthochromatic Filters*. This will be found equally useful, since it gives the most simple but yet accurate explanation of the nature of the photography of colour, and describes exactly how to attain any given result, what filters must be used, and why. The book, containing fifty-four pages, with a complete index, is packed with illustrations, and is sold by Wratten & Wainwright for a modest sixpence.

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The Polarisation of Light.

A Graphic Lecture by Mr. Arthur Brackett, F.I.A.

Clear-obscure glass—Successive sense failures: feeling, hearing, seeing—The wonder of the ether—Electrons in relation to light—Kelvin's striking figure improved upon—The toy, the cloth, and the refraction test—Philosophy of colour changes—Tourmaline crystals and light polarisation.

A SINGULARLY illuminating lecture has been delivered in the Great Hall, Royal Tunbridge Wells, by Mr. Arthur Brackett, a well-known resident of that town. Mr. Brackett is not an engraver—fortunately, perhaps we should add, for even our most asured engravers would not be disposed to make light of the business rivalry of one so successful and eminent as he is in his business sphere. He is an ex-President of the Institute of Estate Agents and a Fellow of the Institute of Auctioneers, following that profession in London and in Tunbridge Wells. We have no apology to offer, despite his not being "one of us," for introducing his lecture to these pages. Just as Mr. Casson, barrister and London County Councillor, is one of the ablest exponents living of the art of Autochrome platemaking (Lumière or other), so Mr. Brackett has brought to the science which underlies platemaking the observation of a singularly well-equipped mind, and has certainly laid us of the engraving world under debt to him. If, indeed, apology were in question at all it might rather take the form of regret that we must abridge the report of his lecture; and further, that we cannot really represent the pleasure he gave to his large audience, since he had laboriously provided many experimental "object lessons" and lantern illustrations.

Mr. Brackett's subject was the "Polarisation of Light." He led up to the specific subject-matter of polarisation by an interesting sketch of what may be called the science and philosophy of light. At the outset he cited the incident of a glazier carrying a dozen or so sheets of ordinary glass and encountering a student of light physics, both men having a short wait on a country platform for a train. The scientist remarked that he could arrange the sheets of glass in such a way that the glazier could not see through them. The glazier expressed his doubts, but the feat was performed; the lecturer setting the sheets of glass at a particular angle—the polarising angle for glass. This kept the light back, for reasons to be developed later. (Mr Brackett reproduced the experiment on the platform.)

He proceeded that we must commence the study of our subject farther back than this, and he at once proceeded to wave motion. Movement was all around us, and in particular as we studied physical phenomena we found one particular form of movement—wave motion. We found waves in water, waves in the air, and waves in another medium which we must ultimately consider. Our ears and eyes were really wave-detectors of a very special kind. Let us ask ourselves: What is a wave? Our thoughts at once passed to the advancing and receding waves of the seashore. Yet, if we thought of the wave rushing towards us on the beach, we were in danger of recalling actual wave motion incorrectly. It was recorded of the artist J. M. W. Turner that he once spent a morning throwing stones into a pond. A friend

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reproved him for his idleness. "No," said the painter, "I have learnt how to paint a ripple." If an artist's eye had to be carefully trained to notice all there was to see when a stone was hurled into a pond, it was not strange that at first sight the movement of a wave appeared to be forward. As a matter of fact, the apparent forward movement was produced by a movement of the particles in the medium at right angles to it. There might be a circular movement as well, but no particle actually moves forward along the line of the wave. This we could see if we produced a series of waves in a rope fastened at one end. The same thing could be illustrated in another way in the lantern.

Mr. Brackett next passed to a condensed and, to many, undoubtedly a startling statement of the relation of various sense phenomena. He said: In a dark room, if a suspended rod is vibrated backwards and forwards ten times in a second, it will reveal itself to our sense of touch if some portion of the body is placed sufficiently near to it. If the velocity of the rod be increased and it be vibrated sixteen times a second, a trained ear might hear a very deep bass note. If the rapidity of the impulses were increased until the rate of motion was doubled or was thirty-two times in the second, a deep note would be heard, but an octave higher in pitch. An increase of the vibrations to sixty-four impulses in the second would raise the pitch another octave. Still quickening the rate of the vibrations to 256 per second, the pitch has risen until it corresponds with middle C on the pianoforte. Still increasing the rapidity of the impulses at upwards of 4000 vibrations per second, the upper note of a full-compass pianoforte is reached. At eleven octaves above the original note the number of vibrations is about 32,000 per second. Increase the rate of vibration still further and no increase in pitch will now result; but this is not all: it is not the whole truth to say there is no increase in pitch. There is no sound. The rate of vibrations has been increased until a point has been reached at which the human ear is powerless to apprehend them. Increase the rate tenfold; we shall not be aware of the change. We have no organs which can apprehend the phenomenon. Increase the rate a hundred-fold, a thousand-fold, even a million-fold. No new sense has come into play which can perceive what is happening. Still continue to increase the enormous velocity until the rate of four hundred billions of impulses per second is reached, and although the ear remains unaffected, a rate of vibration has at length been reached which we apprehend in a different fashion. With the assistance of another organ we again perceive what is going on, and again have a means of comparing the effect produced by one set of vibrations with that produced by a set having a different rate of movement. That portion of the body which is sensitive to these swiftly vibrating waves is the eye.

At upwards of four hundred billions of vibrations in the second a dull red light appears. Still increasing the velocity, the colour of the light alters: the red brightens to orange; this in its turn to yellow; yellow to green, blue, indigo, violet, and then, at a rate of seven hundred billions of vibrations, darkness again—darkness, that is, so far as we are concerned. Light and colour are there, but now the limit of human vision has been reached, and, just as silence followed the sound, when the limit is reached at which human vision ceases,

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blackness, absence of light, is all that we are conscious of. And yet the light and colour are there. The eye of the bee and the ant can perceive them, but the human eye has not yet reached the condition of sensitiveness at which it can do so. Between the last sound we can hear and the dull red light lie more than thirty-four octaves of vibrations. The range of the ear is some eleven octaves at best. The range of the eye is a little more than a single octave of vibrations, and all the light and shade and colour that we see lie within that. Beyond the light that we can see are at least two more octaves of light waves that are only blackness to us. What, too, of that huge and to us meaningless gap that lies between the end of hearing and the beginning of seeing? If a blind man has lost but the power of receiving impressions from a single octave of vibrations, what may there not be in store for us in that little known region of many octaves lying between sound and sight, and that other unknown land lying beyond our limit of vision? Shall we ever evolve new organs which can take up those vibrations?

The eye of the photographic camera, Mr. Brackett proceeded, could see and record at least two more octaves of light waves in addition to the one octave of light waves that were all that we can so far apprehend.

There was this further difference between the waves that we heard as sound and the waves that we saw as light, that sound waves travelled through the air at a comparatively slow rate, taking about four seconds to traverse a mile, whilst the waves we apprehended as light travelled in a different and more mysterious medium, the ether, and at such a pace that a journey seven times round the world would occupy a second.

From the waves in the air we received as sound we passed to those ether waves we apprehended as light—the ether, in the very naming of which we have taken a step from the seen to the unseen. The name was of course nothing, but we could not do without the thing itself. We must conceive it. No eye had seen it. No instrument could weigh it. No vessel could contain it. Nothing we had could measure it. Yet it must be there, here, and everywhere. Heat, light, colour, chemical actinism, and in a sense electricity, all alike were but disturbances in or propagations of disturbances through this something. Absolutely invisible, it was yet the sole key to all physical phenomena, and the marvellous assistance which the study of light-polarisation has given to the investigation of this mysterious subject was a sufficient reason for the study of the subject that evening.

Sir Oliver Lodge spoke of the mixture of curiosity and wonder which a Chinaman felt when he saw, for the first time, in the streets of Chicago a tramcar driven by a rope buried in a pipe underground, the attachment coming through a narrow slit in the pipe and being quite unobtrusive. The Chinaman remarked: "No pushee—no pullee—go like mad." Remember, then, said the lecturer, that whenever we see a thing being moved we must look for the rope. It may be visible or it may be invisible, but without "pushee" or "pullee" there could be no action.

It has long been assumed that light was the effect produced by waves in the ether, but it was not known until recently how these waves were produced.

ELECTRONS

were next dealt with. All matter, said the lecturer, was built up of atoms, and the

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atoms did not touch each other. Were our eyesight sufficiently keen, an iron fender, for example, would be seen to be composed of an inconceivable number of atoms, none touching the other, all in movement at enormous speeds, pervaded by the ether and accompanied by an equally inconceivable number of other bodies—if such a term were allowable—called electrons, compared with which the atom itself is of gigantic size. These, too, are all moving with enormous velocity, many of them in paths of almost planetary distances. The solidity of this solid earth and all upon it was only apparent and not real. It was the intensely rapid movement that gave to us coarse-visioned beings the impression of stability. Mr. Brackett proceeded:—

Lord Kelvin once said that if we could imagine a raindrop magnified to the size of the earth it would appear to be made up of particles larger probably than shot but smaller than small cricket balls. And another writer, imagining one of these shot or small cricket balls again magnified to the size of St. Paul's Cathedral, says that within and around it we should find 10,000 particles of the size of billiard balls flying about in all directions with inconceivable velocity in such a way that they would appear to be a single solid body, although the reverse was the case.

The Cause of Light.

The direct cause of light, then, is the rapid motion of these electrons round atoms of matter. From these come the waves which we perceive as light.

The waves of light travel, as we have seen, in straight lines, but their direction can be changed. They may pass through some substance in such a way that they are abruptly bent out of their course or refracted. A familiar example is the apparent bending of a stick when placed obliquely in water.

The rays of light appear to find it more difficult to travel through some substances than others. Their rate of travel is reduced as they pass through glass, and if they enter the glass obliquely, as when they pass through a prism, they are bent round or refracted, those rays which pass through the greatest thickness of glass being affected the most. The ordinary spectrum of sunlight, that beautiful rainbow patch of light produced by the passage of sunlight through the prism, is familiar to everybody.

This bending aside can be illustrated by a triangle of cloth laid on a smooth table. The table will represent the air and the cloth the prism of glass. If a pair of wheels from a child's toy are run across the cloth the wheel which has the longer journey on the cloth will be slowed down more than the wheel that has the shorter journey, and the path of the wheels will be bent round or refracted. This is exactly what takes place when a ray of light passes from one medium into another. It was by slowing down some of the rays in this way that Newton was able to split up his ray of white light into the rainbow-coloured path which we call the "spectrum."

We speak of colour, but there is no such thing. We see a thing as red. The electrons have produced waves in the ether of a certain length. The electrons that do this work are all identical, but some are imprisoned within and others revolve round atoms at a greater distance or at a less distance, the nearer ones at a greater pace. When an object contains a variety of atoms with electrons capable of revolving at all the different rates which produce colour sensations, then what is called white light is reflected to

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our eyes. That this is so will now be shown, as with this revolving disc we shall mix the various separate colours and obtain as a result white light. The same effect will also be shown in the lantern. (Experiment and slide illustration were here shown.)

We shall then see, in the tank which will be projected on the screen, first a mixture of two weak and almost colourless solutions produce a vivid Prussian blue, as prussiate of potash is formed. Another mixture will change to a rich brown, a blue to red and back again to blue, and a fourth to a rich salmon colour, and with another chemical change to a colourless solution again.

In doing this we have made a chemical combination of the salts in the various solutions and have so changed the molecules that they pass on to the screen ether waves of a different length from those which either of the separate salts did, and these altered waves entering our eyes produce the effects which we describe as seeing the various colours that have appeared on the screen.

Then light waves may be reflected or thrown back. An example of reflection is shown when a ray of light is reflected by the carbon particles forming smoke in such a way as to make the smoke visible. Though the carbon particles are black, the light reflected from them is white.

Here is a glass jar of water from which the dust has been filtered so that the light is allowed to pass through it with little reflection. A few drops of milk are added, and sufficient light is now reflected from the particles in the milk to convert the jar into a lantern.

Light may be totally reflected, and a case of total reflection will be seen in the luminous cascade which will now be shown. Into a jet of falling water a ray of parallel light is directed, and here it is imprisoned, reflected backwards and forwards from side to side of the jet until the jet reaches the floor, where the light escapes.

Refraction and reflection form the very foundation of the explanation of polarisation.

Polarisation by Tourmalines.

The polarisation of light may be simply studied by means of the crystal called tourmaline. If we take a plate of tourmaline, says Dr. Spottiswoode, cut parallel to the particular direction within the crystal known as the optic axis, and place it in the path of a beam of light at right angles to the direction of the beam, the only effect perceptible to the unassisted eye will be a slight colouring of the light after it has passed through the crystal; but if the transmitted beam be then examined by a second plate of tourmaline placed parallel to the former one, the following effects will be observed:—When the two plates are similarly placed as if they formed one and the same block of crystal (that is, with their optic axes parallel), all that will be perceived is the slight colouring of the light due to any tint there may be in the plates; but if either of the two plates be revolved in its own plane the light will be seen to gradually fade until at a position at right angles to its former position it becomes completely extinguished. If the turning be continued beyond the right angle the light will begin to revive, and when a second right angle has been completed it will be as bright as at the outset. Something has evidently happened to the beam of light in its passage through the first crystal which has made it impossible for it to pass through the second crystal, except when it is in the same position with regard to its optic axis as is the

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first. The first crystal has absorbed all the waves of light that are not perpendicular.

An Arrow Illustration.

This effect is compared by Sir John Herschel to what might be expected to happen if a flight of flattened arrows were discharged at a grating of parallel wires. If the wires and the planes of the arrows are parallel, the arrows would get through, and through as many other gratings as were also parallel; but were one grating placed crosswise, the flight of arrows would be stopped. If we imagine a beam of light to consist of a flight of arrows and the first tourmaline to be the grating, this will stop all the arrows that are not travelling with their feathers perpendicular. They will get through the second tourmaline if it is in the same position as the first, but if it is placed crosswise the remainder of the arrows will be stopped, and the ray of light is in this way extinguished.

A Frenchman's Experiment.

In 1808 a scientific Frenchman named Malus lived in the Rue d'Enfer, in Paris. His study window looked out on the Luxembourg Palace. Sitting there one evening he was watching the reflection of the sun in the Palace windows opposite. In his hand he held a prism of Iceland spar, and through this he looked at the reflected sun. He saw then, of course, two images of the sun, but as he happened to turn the crystal he noticed that one of the images disappeared as he reached a certain position, and that as he proceeded until the crystal was at right angles to that position, the image re-appeared, but the first image had disappeared. When the crystal was held in an intermediate position, the glare was visible in both images, but unequally divided between them, unless the position was exactly intermediate, or at 45 degrees from its first position. The ray of light had evidently acquired some peculiar property through first of all its reflection from the glass of the window, and then its passage through the piece of glass of the window, and then its passage through the piece of Iceland spar. The whole sequence occurred whilst he moved the crystal through an angle of 180 degrees, or half a circle. As he thought on the subject, he was reminded of the action of a magnetic needle, which in moving from north to south also passes through an angle of 180 degrees, and there seemed to him an analogy (though a loose one) between the peculiarity acquired by the ray of light and the directional character of a magnetic needle. Hence the condition in which the ray was found he called "polarity." The ray was said to be polarised, and the instrument constructed for its examination was called the polariscope.

(To be continued.)

Facings and Pacings.

By "Ion."

The new hours usage has become the new order, without apparently any very serious effects so far manifest, nor any very vocal lamentations even. But I believe the quietude has a simple and satisfactory explanation. I believe it simply means that the trade is revolving the best way of securing a corresponding access of price from the public. It could do this with enormous advantage to sorely tried treasuries, and without the public being conscious of any sort of hardship.

One real difficulty in the electrotyping world is that the public know so little of the art and mystery. When I worked in

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a London foundry it was not considered at all remarkable to receive a letter from a printer instructing that an electro was to be made from some sketch which he enclosed; and particularly impressing that he did not want to have a zinc or copper or a wood block made; he wanted an electro, and why on earth couldn't we carry through the order and send the block and the blessed 1/- invoice without so much fuss?

I remember a firm who were long-standing advertisers in a journal of such a special character as to suggest that the advertiser really ought to have known something of electrotyping. Well, the editor vexed his righteous soul, issue after issue, over the glassy smoothness to which the unchanged half-tone electro in the "ad." had become reduced, and over the meaningless mark it marked upon the printed page. But he couldn't induce the firm to send a new block. At last, in sheer desperation, he took the block out and sent it back to the advertiser. That bright individual ordered it to be sent to a foundry with request for another electro taken from it. He then sent that new electro to the editor. Certainly it looked fairly bright. He wrote that he was now sending an absolutely new block, and he hoped therefore he should hear no more complaints.

The editor wished that instead of sending the block to the advertiser he could have sent the advertiser to the block.

And now, jumping from what I've just been saying, and even seeming to be jumping upon it, let me say that one notion sometimes put forward—that an electro can improve on an original—is not always so foolish as it may seem. One particular in which this improvement can be made is in the matter of angles formed by mortising rule.

With the best making-up there is apt to be daylight at the actual corner. This is, of course, reproduced in the mould, but either the mould can be doctored at the angles, or the "slabber" can beat up the malleable copper just there, or a bit of soldering can do all that is needful. Anyway, the electro can surpass the original.

July's first Saturday has for a very long tale of years been the day on which the foundries of London have taken their annual outing. There is some reason to hope that the Saturday holiday this year will be not the least hearty and happy of the long series. For one thing, this warm weather disposes, or should dispose, one to a kindly thought of the worker in the black shop, where sometimes I have known the temperature to mount to about 120°. But apart from any sentiment, there is, I think, a general consciousness that, wherever the fault of disappointing profits may properly attach, it cannot to any great extent be said to rest with the worker.

I'll suggest one or two causes more reasonably to be credited with losses and crosses. Bad wax is one. I have known a great amount of trouble in a foundry traced finally to a hundredweight or two of so-called best Gambia beeswax which really ought to have gone back to the merchant. There has been some artfulness, perhaps, on the part of the collector or the exporter. He has gathered up and roped in, or rubbed in, any sort of rubbish, and it all passed as the best thing bees could do. A lot of earth waxes may be mixed with beeswax and sold at best beeswax rates.

I'm not saying beeswax is the best thing. A leading foundry in London has long discarded it for Ozokerite, the material mainly used in America.

Then there are little oddities in the way

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of ordering. A firm will ask for a price for 5000 blocks to be supplied in lots of a few hundreds, and accept the rate (naturally a very low one, the work being understood to be competitive), and then will start the foundry on the order; and when it has ordered, say, 1000 or even 500 only, it will send no more. It becomes known that the customer is dividing the work round. He let each of several foundries suppose it was to have the whole 5000 order, and then expected each one to do its bit at the very low rate quoted for the lot.

Money is lost at times for want of a tactful visit and confab with a customer who has asked something unreasonable. My own practice when my firm got an order for 500 half-page stereos, "to-morrow at 4 o'clock, certain," was to go to the sender, if his office was reasonably near, thank him, assure him of attention, and put it to him straight if it would not meet his need if he had, say, 40 the next day at 4 o'clock, so many an hour or two later than 4 o'clock, and a larger number at 4 next day, and if so, what balance could be left till a third day, or a fourth? If all must be made that same day, then we would go on with them all at once, but that was not the way for the customer to get the best results from the electrotyper. I found this line was generally successful.

It seemed to be appreciated by the customer. He isn't always wicked at heart! "A man may smile and smile," and still he may not "be a villain."

City and Guilds of London Institute.

Its Questions on our Crafts.

The following were the questions (with marks obtainable) set on May 3rd to candidates in the Technical Official Examination conducted by this Institute.

Ordinary Grade.

1. What are the constituents of a developer for wet collodion plates, and what is the part played by each in the production of the developed image? (20 marks.)

2. A wet collodion plate, after removal from the sensitising bath, is thoroughly washed with water and afterwards exposed in the camera in the ordinary way. It is then treated with a developer of the usual composition for wet plates. Describe what takes place, and give any explanation you may think necessary. (20.)

3. The collodion used in line work is iodised with cadmium and ammonium salts and the sensitising bath is of the usual composition. After considerable use the bath refuses to work satisfactorily. State the defects you are likely to meet with, and name the impurities in the solution. Can you restore the bath to its original condition by any simple means? If not, what improvements are practicable and how would you effect them? (50.)

4. Describe the difference you would expect to find in wet collodion negatives prepared with strong and weak sensitising baths respectively. How does the concentration of the developer affect the character of the negative? (25.)

5. What is collodion emulsion, and what advantages are claimed for it? In what way does the development of the exposed surface differ from that of a wet collodion plate? (30.)

6. Would you be able to make entirely satisfactory half-tone negatives upon rapid gelatino-bromide dry plates? If not, what kind of difficulties would you expect to meet with? (25.)

7. Describe carefully a prism and a mirror, as used for negative making. What determines the excellence of both of these devices? (20.)

8. In spite of all care being taken when focussing, the negatives made are not sharp. How would you find out the cause of the defect? (30.)

9. What are the methods which are usually adopted for producing "tints" upon line plates?

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How must the plate be prepared for receiving the tint? (30.)

10. What are the causes of the following troubles in bichromated fish glue printing and resist making:—(*a*) Intensitiveness, (*b*) scum, (*c*) spongy prints, (*d*) resist not remaining on the metal during etching? (50)

11. Explain the working of any satisfactory method by which a combined line and half-tone block may be made. (30.)

12. How may vignetted half-tone plates be prepared and mounted so as to assist the printer to produce a softly shaded edge on the prints? (30.)

13. What is the difference between a direct and a transfer photolithographic process? Describe either of these. Supposing considerable accuracy and fineness of rendering to be required, which process would you prefer, and why? (50.)

14. Explain how it is possible to convert a bromide print from a line negative into a photo-lithographic transfer. (50.)

15. What is a "pneumatic" printing frame, and upon what principle does its action depend? What are its advantages? (25.)

HONOURS GRADE.

1. You are required to make a photographic picture of a fine lace curtain by means of the line zinc process. Describe exactly how you would proceed, drawing particular attention to difficulties you would expect to encounter. (50 marks.)

2. Describe any devices and methods with which you are acquainted for accurate focussing. (20.)

3. What are the chief difficulties to be met with in three-colour work, so far as the making of the negatives is concerned? (50.)

4. What is a mercury-vapour lamp? Give a rough sketch of the system required and name the essential parts. For what class of work undertaken by process houses can such a lamp be satisfactorily used? (50.)

5. Occasionally artificial line negatives may be found useful. Describe very briefly some ways in which such negatives may be made. (25.)

6. How would you prepare flat tint plates for use with half-tone blocks? What means would you adopt for "keying" so that the tint portions were true to size and register with the corresponding portions in the half-tone block? (30.)

7. Describe the Levy powdering machine, and explain how it works. (30.)

8. Explain what is meant by *offset* printing, and discuss the possible advantages of this method of printing from the standpoint of the photo-engraver. (50.)

9. State what you know of any recent advance in the printing of illustrations in newspapers. (30.)

10. Give a short account of the method of production of an intaglio printing plate by the Talbot Klic and inverted half-tone processes respectively. How do these methods compare, so far as regards the means employed for the rendering of tone, with that adopted in the rotary intaglio process? (50.)

11. How may the sensitiveness of bitumen to light be increased? State what you know of any recent investigation in this direction. (30.)

12. What is an "overlay," and why is it considered necessary? How does a printer usually produce an overlay? Give an account of any practically useful process which will furnish a result quickly and economically suitable for half-tone block printing. (50.)

13. A drawing in black outline with simple gradations of colour is to be reproduced in five printings to half scale, using hand work for the production of the colour plates, four in number. Describe how you would produce the outline block from the drawing and the necessary blocks for the colours, true to register. (75.)

14. You are required to make a reproduction of an illuminated MS. in which gold work in relief occurs. How would you reproduce this gold work so as to render the effect of the original? (30.)

15. Describe briefly the machines used for carrying out the following operations:—(*a*) Cutting plates into ovals and circles, (*b*) lining and bevelling, (*c*) trimming, (*d*) surfacing wood mounts. (50.)

16. You are given a drawing in monochrome which consists of a portrait in wash, surrounded by a pure line ornamental border. This is to be reproduced by the collotype process, and it is particularly required that the ground of the border be free from tint, whilst the gradations of the portrait are to be retained. State how you would produce a negative suitable for the platemaker's purpose. (35.)

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My Causerie.

MR. E. HAMEL of Nottingham is "part of the host" who've "crossed the flood," to quote a phrase fraught with hymnal recollections. He went to the States and was a pupil of the Levy Brothers, or one of them, in Philadelphia in days which are really recent, though they doubtless seem to him to be centuries bygone. He can't keep away from America even now, when he is a prosperous Nottingham engraver. Quite recently he was the guest at dinner of the Master Photo-Engravers of New York. What a lot he'll have that he won't tell us when he comes back—won't tells us, I mean, unless I get hold of him; then he may find that somehow his last-acquired knowledge oozes out. But in that case, like the good sportsman he is, he will say, "Print away; I don't mind. After all, knowledge is a less ruinous competitor than ignorance." And I, like a good sportsman too, shall give him no reasonable cause to complain in anything published.

He really owes me a turn for putting such a fine epigram into his mouth.

I see that the printing and map-making department of the Ordnance Survey employs 463 persons, who produce work of the value of £76,670, of which £63,470 is for sale and £13,200 is for other Government Departments. This Department has its habitat at Southampton. The works are extraordinarily well worth seeing—if you can get the due permit. There is much virtue in that "if."

I visited the Royal Photographic Society's Exhibition at the Prince's Rink at Knightsbridge, and noted, what I see the Wellington Street organ justly sets forth, that the principal process exhibit was that sent by the L.C.C. School of Photo-Engraving, arranged to show recent developments. Thus there were several frames of newspaper illustrations produced by rotary photogravure, improved relief methods of printing, and new screens. There was also a frame of rotary photogravures in colour, mostly by the Van Dyck Gravure Company of New York; one example, however, being by the Rembrandt Intaglio Company of Lancaster.

The visitor to the hall who might happen to be chiefly interested in the ultimate transference of camera impressions to paper for the million (or for the thousand) had really no need to go away with scanty gleaning. There were, for instance, several examples of three-colour work printed from the offset press, and a set of stages showing how the bromoil process could be adapted to photolithography. There was also a frame showing the use which could be made of the Norwich shading film. Some magnificent colour collotype was contributed by F. Hollyer, and a frame showing how "Redcol" might be applied to photolithography, by G. C. Laws.

Dr. Mees was one of the busy men on the Rink when I called. There was no getting a word with him then; or little more than "How do?" and "Olive Oil"—or is it "au revoir"? Still there was the Wratten & Wainwright stand to be noted, where he was present in spirit. We saw frames of spectrum photographs showing transmission of ultra violet by various gelatine filters, and hard by we could study curves showing absorption of various colours (including those used in three-colour printing) by the L.C.C. School of Photo-Engraving, who also show results with a new lens-testing camera designed to test lenses for three-colour work.

Messrs. A. E. Dent & Co. had an exhibit of three-colour half-tones, and the Anglo Engraving Company showed fine monochrome and colour half-tone, and examples of their successful Rotary photogravure.

There has been a great deal of talk of late about what can be done in the way of combined intaglio and offset, and now here comes along Mr. Bendixson, of the Fine Arts Publishing Company, and understood to be connected up with the Rembrandt Intaglio Engraving Company of Lancaster, who jointly with Mr. Widdop, erstwhile of De La Rue's but now also understood to be associated with the Rembrandt Company, takes out a patent dealing with this matter. So the photogravure and the offset pots are kept boiling.

I have for a year or two been waiting to hear from Mr. Widdop on this subject. Photogravure and offset and litho-photogravure have been his mental meat and drink for some time; not quite a bland and merely satiating drink either, but a veritable mental stimulant.

Mr. Widdop is one of those keen craftsmen who "let themselves go," who are not ashamed to be enthusiasts in fine art work, and who are intolerant of the half-hearted everywhere. We are all accustomed to thank heaven for the men who are the salt of the earth. But I say, "Thank heaven also for the craftsmen who are the pepper of the earth." And Mr. Widdop is as keen as that Colman's traveller in Mid Africa who when escape was hopeless besought his cannibal captors to eat him with Colman's mustard.

F. COLEBROOK.

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Index of Current Literature.

The British Journal of Photography (April 28th and May 5th) deals with "Chromium and Gelatine" and reprints Mr. Saalburg's patent No. 11,527 of 1910 dealing with rotary photogravure in colour. On May 5th the precautions necessary in handling nitric acid are detailed, and there is a note on the progress of photo-mechanical work.

May 12th issue deals with the R P.S. Exhibition, devoting a section to the photo-mechanical exhibits.

May 19th issue quotes Patent No. 25,870 of 1910, granted to Bendixson and Widdop for improvements in colour printing, consisting in the use of monochrome photogravure, and lithographic colours, and deals with the unfair attitude of the new Copyright Bill towards photographers as compared with painters and other artists.

The current *Platemakers' Criterion* contains more notes about cost and the commercial conditions of the craft.

The American Printer for May has articles on "Advertising and Art," "When the Printer Needs a Plate in a Hurry," and "Photographing Direct on Metal."

The American Photo-Engraver for May contains articles on "Organisation among Employers and Employees," "The Scab Boss," "Averaging Employees at Different Wage Rates"; and an editorial dealing with the action of the courts in regard to organised labour.

The current *British Printer* has reports of an address by Mr. J. D. Davidson on "Half-tone Printing."

The British and Colonial Printer and Stationer of April 27th reports a lecture on "Amphitype Photolithography," by H. L. Shawcross, the inventor; "Some Physical Qualities of Paper" are discussed by R. W. Sindall.

Process Work and Electrotyping of May in its "Questions and Answers" deals exhaustively with Stopping Out, Aerograph Retouching, and Streaks on Wet Plates.

The Printing Art for April is very interesting and attractive. Besides the very fine specimens of all kinds of engravings in this handsome journal, the most important article for the engraver is a short one on "Preparing Copy for the Printer," which is full of good advice that would frequently be helpful. Among other articles are "The Principle of Selling Literature," "Paper Sizes and their Proportion," and "Scope of the Mail Order Catalogue."

The Inland Printer (May) deals with "How Electric Lamp Labels are Made," "The Scientific Testing of Paper." Mr. Horgan's causerie contains notes on "Offset Transfers," "Silver Bath Troubles," "Half-tone Screen Patents," "Chalk Plates," "Developing Albumen Prints," "Lead Intensifier," "Half-tones from Rough-surfaced Paper," and paragraphs respecting the New York photo-engravers' men's union and the New York employers, who had at their last monthly meeting and dinner Mr. E. Hamel of Nottingham as guest.

Zeitschrift für Reproductionstechnik for May has articles on "Register Marks in Three-colour Work," on "The Dangers to Health of Working with Cyanide,"on "Enamel Printing on Metal," on "Comparison of Intensifiers and Reducers," on "Half-tones for Newspaper Printing," and on "The Treatment of Zinc Plates after Failures in Transferring."

Zeitschrift für Reproductionstechnik for April contained articles as under: "On the Dangers of Nitric Acid," "Further Comparisons of Intensifiers and Reducers," "Transfers from Half-tone on Stone and Zinc," "A New Process for Production of Matt Prints," and "On the Influence of Light Source on Three-colour Exposures."

Intaglio and Litho in Combination.

THE BENDIXSON AND WIDDOP PATENT.

THE following is the complete specification of Patent 25,870 taken out by Mr. Harold Bendixson, director, of 36 Basinghall Street, and Mr. John Widdop, lithographer, of the same address:—

"This invention relates to colour printing and the like, and has for its object to produce high-class colour prints at a high speed, at a low cost, and of a kind not hitherto attained.

"The invention consists in preparing a suitable monochrome photogravure by rotary gravure intaglio printing and subsequently applying colours thereto by a lithographic process.

"The invention also consists in the improved processes and products indicated herein.

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"In carrying the invention into effect in one form, by way of example we print monochrome photogravures by a rotary process of any desired kind, except that we aim at the production of a more or less hard print, the reason for which will be understood from the following:—

"If an ordinary photogravure print be coloured especially with transparent colours, or colours having little body, the effect on the parts which should be light will be that they are either too dark or muddy, because with monochrome work these parts must have sufficient shading on them to produce the desired depth of effect in itself; and therefore, if colour be applied to an already fully printed part of this kind, the depth of colour thereon will be too great in relation to the depth of colour on the shadows, because adding colour to the shadows of a monochrome print will not materially darken them.

"It will thus be seen that the parts which when coloured should be light in a print suitable for the present process, should only receive so much shading in the monochrome gravure as will be sufficient to give the outline or proper modelling effect or both to the colour subsequently applied. This cannot be effected properly merely by producing a light print, because in that case the darker parts would not have sufficient depth for the necessary rich effect to be obtained, but a print of the character which we have called 'hard' is required, and this is the kind of print to which we refer as a suitable print for the present process, and it is a print which in monochrome would not be a really satisfactory production.

"A print of this character can be obtained in several ways; for example, by lightening the parts which when coloured are to be light on the gravure-etched surface or by modifications in the development of the photographs employed in producing such surface, or by retouching at any desired stage, the aim being to get an effect of the kind described above.

"In carrying the invention into effect in one form we photograph a painting or representation in colour of any kind by means of appropriate light-filters and plates. From these we prepare a negative to produce the effect desired for the intaglio monochrome printing surface, and from the other negatives suitable photolitho transfers are made by a half-tone screenless process for the various colours; that is to say, instead of photographing through a screen, the desired reticulation or graining is obtained in any suitable way on the transfer. From these transfers lithographic stones are prepared, each corresponding to one colour.

"In place of stone aluminium or zinc may be employed.

"Another method of preparing the colour plates consists in printing in litho ink on to transfer paper from the monochrome printing surface and then transferring these transfers to a number of lithographic stones.

"Each of these stones is then worked to correspond to a single colour, the ink being removed from parts on one stone, and added to on another stone as desired.

"By means of these stones with suitable coloured inks the colours are applied to the monochrome gravure, care being taken to ensure perfect register, and in this manner a high-class colour print having as basis a monochrome gravure with the colours applied by lithography is obtained and at a cheap cost, because the cost of producing gravures by a rotary process and colouring them by lithography is small, especially if rotary or offset lithographic processes be adopted.

"It will be understood that the processes indicated above are described by way of example only, and modifications may be made therein as desired.

"It will also be appreciated that instead of printing on monochrome gravure first and applying colours thereto, the colours may first be printed and then the gravure printed over this; but in this case such ink must be used for the gravure that it does not obliterate or spoil the colour effect.

"Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is:—

"1. A process for the production of colour prints which consists in preparing a suitable monochrome photogravure print by a rotary gravure process and producing the desired colouring by lithography; substantially as and for the purposes described.

"2. The improved processes for the production of colour prints herein described.

"3. The improved colour prints herein described."

ON May 24th Dr. C. E. K. Mees lectured at the L.C.C. School of Photo-Engraving on "Development." His lecture was illustrated by many ingenious and instructive experiments.

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Brevities.

WE have seen a copy of the *Norwich Mercury*, in which the half-tone illustrations are exceptionally fine—better than those in most newspapers, and probably equal to the best. They are interesting because the photographs and blocks are almost entirely made by former students of the L.C.C. School of Photo-Engraving

PREPARATIONS are being made by several famous artists, including W. Nicholson, J. Pryde, and Frank Brangwyn, to start a new art paper, printed in colour. "It is an ambitious scheme" (writes a *London Opinion* correspondent), and he adds: "I hear there is money behind it; but I mistrust the reported idea of the editorship being vested in an artistic and literary committee. I remember a former art paper with such an arrangement."

MESSRS. PHILIPSON, SON & SKILLETER, engravers, of Newcastle-on-Tyne, inform us that Mr. Frederick Walter Skilleter has retired from this firm as from the 6th day of May 1911, and the business will in future be carried on by Messrs. John Philipson and James Metcalf Philipson under the style of Philipson & Son. The new firm will receive and pay all debts due to and owing by the said late partnership of Philipson, Son & Skilleter.

PHOTOGRAPHIC COPYRIGHT.—Mr. Geo. Davison of Harlech, writing in the *British Journal of Photography* on the subject of the status of photography in the Copyright Bill, says: "You may have seen in the Copyright Bill now before the House of Commons it is proposed to make an alteration in the copyright for photographs to fifty years, although the Gorell Report, pp. 18-19, of the Copyright Commission recommended giving the same treatment to photographs as to any other form of pictorial art, as it has been previously. I am sure that all photographers — whether directly interested in pictorial photography or not—would feel that a most determined stand and movement should be made immediately to prevent this change.

"If anything were done, it would have to be done at once. . . . A good many of your readers interested in this matter would, I should think, be able to help to explain the position to, and to influence, their Members of Parliament. . . .

"It ought to be added that I believe some other evidence was put in, stating that photographers were willing to accept fifty years only for *all* photographs. There is, however, I am sure you will agree, an important principle involved in the interests of photography which ought not to be lost sight of.

"It may be advisable to form as strong a committee as possible immediately to ensure that the interests of photography are fully considered whilst the Bill is under consideration."

A PRINTING TRADE SCHOOL AT ROTTERDAM.—There having been a general demand on the part of the printing trade associations of both employers and employed in Rotterdam for the establishment of a school of instruction in typography, a series of classes has just been commenced, under the joint auspices of the Government, the authorities of the town and province, and the Master Printers' Association. The members of the latter have agreed to allow the pupils of the school to attend their premises during the second and third years of their course of study. The fee will be 5 florins per year (about 8s. 4d.), all material and plant being provided by the school, as well as two workroom blouses each year. During the first year of study the pupils will pass all their time at the school, *i.e.* thirty-eight hours per week, of which twenty hours is devoted to instruction in composing and machine work and the remainder divided as follows: Freehand drawing, three hours; ornamental drawing, two hours; line-drawing, six hours; grammar and reading, 1½ hours; writing and revising, 1½ hours; arithmetic, two hours; foreign languages, two hours. In the second year of the course the pupil only passes twenty hours per week at the school, about thirty hours being put in at some printing establishment, as just mentioned. The twenty hours is to be divided as follows: Freehand drawing, two hours; ornamental design, two hours; practical design, six hours; languages, four hours (*i.e.* Dutch, one hour, and foreign languages, three hours); writing, one hour; arithmetic, two hours; theory of typography, three hours. In the third year of the course the twenty hours' theoretical work is devoted principally to design and the theory of printing.

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Estab. Jan. 1894.
"The Process Photogram."

THE PROCESS ENGRAVER'S MONTHLY

Vol. XVIII. No. 211.
JULY 1911.

AND ELECTROTYPER'S AND STEREOTYPER'S REVIEW

The Coronation and the Engraver.

The Coronation is over—shouting and all. As the *Star's* "Asterisk" writer reminded us, during the great week, "Solomon in all his glory was not 'hoorayed' like one of these." We shall soon be forgetting everything except perhaps the barricades, and as to these, all that will be needful will be to give Sidney Smith's old wheeze a twist, and say that the next time the officials have a hankering after some wood barricades, they had better put their heads together and the thing will be done. For us, questioning comes to mind as to whether on the whole the occasion has revealed process-engraving in its strength. Has it had a chance? If so, has it made the most of the chance? The answer is not quite easy. We have realised afresh how grey our printing has become. Surely long before that gala day when there is another national festival to celebrate—shall we hazard the guess?—the marriage of the heir to the throne, our British and American newspapers will have improved upon the hint now being offered from Germany, and will have devised some steam-moistening of their paper reels adapted even to the demands of the fastest running presses; so that their illustrations and their reading matter shall stand out in some sort of contrast to the paper on which they are impressed. No doubt it is mere futility to sigh for the old devices of spraying the reels and giving time for the water to penetrate; or for the alternative of winding the reels over steel rollers kept moistened during that winding. But steaming seems to be a more hopeful word. It seems to us that it is up to the engraver to keep this need present to consciousness. For the engraver gets blame which he does not deserve. Here we have before us a daily of Saturday, 24th June. Undoubtedly you do discover, after a careful scrutiny, that the eight rather disreputable-looking "jockeys" are not accompanying some crinkled walnuts carefully extracted whole from the shells, but that those walnuts become caparisoned horses if you only watch them intently. The fairy godmother produced something like that effect in the Cinderella story. The worst is that we haven't much time for such watching; we have to turn quickly to the next picture puzzle. Here is the *Sketch* of the same date. We wish it every success; for the boycott which is being attempted by some reputed millionaire newspaper proprietaries, the reported threats of discontinuance of their own supplies unless agents decline to sell the *Sketch*, is a sort of savagery which would have been out of date at the time of the coronation of a Plantagenet king. This combination, however, cannot kill the *Sketch*, but the *Sketch* can kill

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itself; and continuing nocturnes like some pictures before us might come near doing it. All the large faces want washing, and one suspects this of some small faces but cannot prove it, because one cannot see anything of them at all. We have no great wish for *lèse-majesté* to become a familiar British terror, but our loyalty suggests arming the royal family against some of the pictoral libels of some of these journals. Confining mention to London journals, the *Daily Mail* scored tremendously on this Saturday with the profusion of its pictures and their clearness. The *Daily Mirror* was also very successful; it scored with a large picture of a scene in the Abbey taken by Sir Benjamin Stone, the only photographer admitted in the sacred precincts. The *Express* was frankly disappointing on that day. The *Daily Telegraph* several times made avail of the wonderful Cycloramic pictures taken by the Photochrom Company Ltd. This has probably been the most successful use of the Cycloramic camera yet made. More than one office has equipped itself with this apparatus, but a short while since our information was that only the Photochrom Company had found itself easily able to make effective use of it; though on a matter in the nature of things so little likely to be bruited abroad, we certainly speak under correction.

Turning to colour we are on the whole much better pleased. One great and important matter has been that the editors have begun at the beginning. They have not grudged money to good artists. The *Sphere*, for instance, commissioned the production of a quite remarkable composite picture of old-time kings of England or the United Kingdom on the left of the throne and of old-time queens on the right, all giving greeting to the present throne occupants. That picture will stand a lot of close scrutiny, and continually yield some fresh points. The *Illustrated London News* described the Abbey scenes in a "Panorama" oblong number; that is, it doubled its 16 × 11½-inch page to a 16 × 23-inch opening lengthwise, with fine coloured cover, two notable outer pages in colour (pp. 1 and 28), and all the rest a fine series of pleasant monochrome, with just enough reading to explain the pictures. It got to press with this on Cottrell sheet-fed rotary on the evening of the 25th; it soon ran off 100,000, and when we closed for press it was still pouring out its fine panoramic publication. The great illustrateds are referred to in our "Causerie," and we will only say further that they have worthily supported their repute. There has been no occasion hitherto when so great a mass of coloured work has issued from the presses of one city relative to one occasion. That would be poor contemplation if the quantity were the most notable feature of the phenomenon, as in the case of the monochrome in some daily papers. But in this case the quality has been worthy of the journals. One comment may here be made, namely, as to the marked difference of method between the old style and the new. When Queen Victoria's Diamond Jubilee was celebrated in 1897, the *Illustrated London News* relied entirely upon chromolithography for the production of what was called "The Record Number of the Record Reign." In 1911 the *Sphere* has used no litho at all; nor, that we have noticed, has any of the greater illustrated journals, except the *Illustrated London News* itself, and it has restricted its chromolitho to five royal portraits. What changes, we wonder, will the next fourteen years bring in their train as touching illustration?

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Greens in Three-Colour Work.

By A. J. Bull, London County Council School of Photo-Engraving and Lithography.

THE three-colour block-maker is always confronted with difficulty in the reproduction of certain colours. Among these are the greens, which are almost always reproduced too low in tone, and if at all dark may even be brownish in hue. It is one of the little colour difficulties which have to be overcome by fine-etching. The effect is as if the green negative had not recorded the greens sufficiently, as if, indeed, the photographic plate were not as sensitive to green light as could be desired. Yet with the sensitisers in use at the present time a really good sensitiveness to green light is produced, while the dyes available for filter-making allow of considerable latitude of adjustment. It must, of course, be recognised that if the filter is not carefully adjusted it may itself produce defects in the colour rendering, but, on the other hand, no adjustment of filter and plate seems able to eliminate the trouble.

If, however, we examine the nature of green colours and follow out their reproduction we shall find that there exist certain peculiarities which in great measure account for the trouble, if they do not entirely do so.

If greens are examined with regard to the light which they reflect it will be found, of course, that they reflect more green than any other kind of light, but in very few cases is the proportion of green light high, and when it is, the colour is a mere tint, the other components of white light being reflected in considerable quantity. The curves in fig. 1 indicate the percentage of each part of the spectrum of white light that is reflected by the colour in question, and they give some of the results of measurements of a number of greens chosen at random from both natural and artificial colours. The curves show that in the darker tints of vegetation only a very small proportion of the green light in the white which falls on it is reflected. In the case of holly leaves the maximum reflection only reaches 12 per cent., and in some samples of ivy and Scotch fir the figures were 11 per cent. and 8 per cent. respectively,

While this might perhaps be expected, it is a little surprising to find that in the lightest greens of spring vegetation the reflection of green light does not reach a high figure, the maximum for the young leaves of the silver birch and the beech only reaching 19 per cent. and 32 per cent., while their average reflection of green light must be lower than this. The case is somewhat similar with the greens used for painting and printing. The two greens taken from water-colour sketches show maxima of only 30 per cent. and 48 per cent., while the very lightly printed emerald green ink, in which a reflection of green light as high as 72 per cent. is reached, also reflects considerable amounts of both blue and red light.

It would seem indeed that it is a quite general property of green colours that in no case do they reflect a large amount of their own colour, except when they become light tints having a considerable proportion of white. This is further borne out by the last curve, which shows that the light transmitted by a green three-colour filter is only a fraction of the

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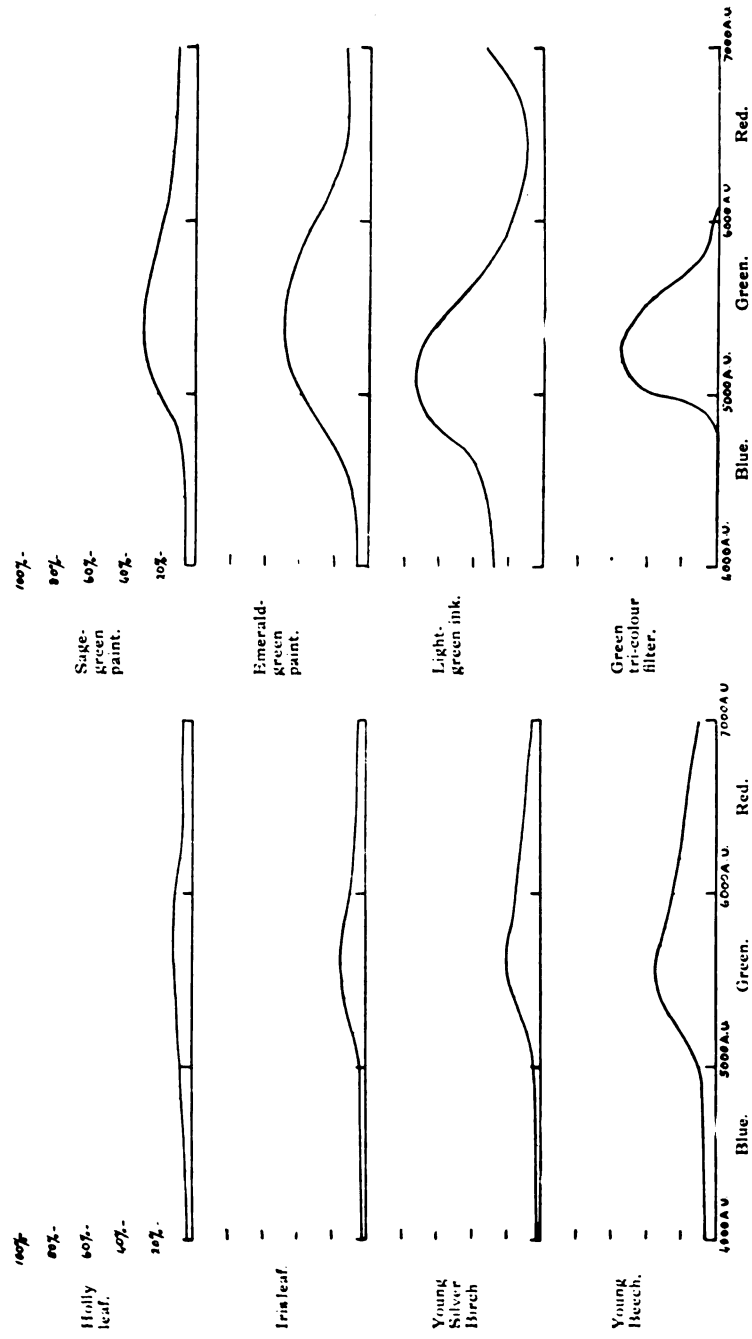

FIG. 1. Curves showing the proportion of each component of white light reflected by the several green objects.

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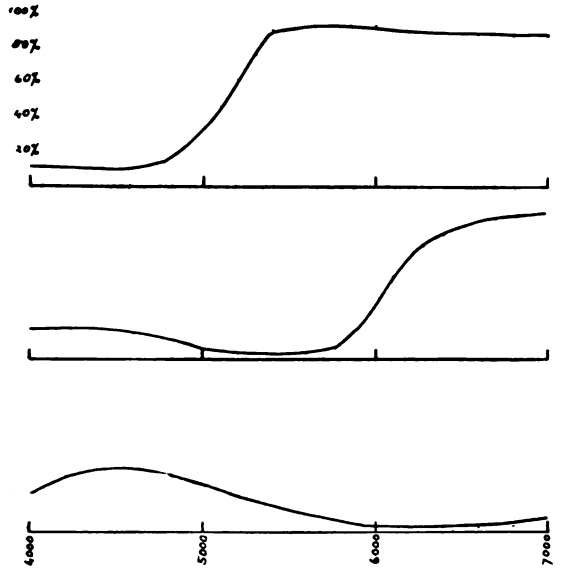

FIG. 2.—Curves showing proportion of spectrum reflected by a set of three-colour inks.

light which falls on it. Therefore it is quite proper that common greens should not be recorded by full density on the photographic plate.

If we now consider in what manner a green is reproduced by the three-colour process, we find that a green is only photographically recorded in the green negative (red printing plate), the other two negatives treating it as a black. The green is therefore primarily rendered by the superposition of the printing inks used for the red and blue negatives, namely, blue ink and yellow ink, and in addition there is printed an amount of red, or rather crimson, ink, which is smaller in proportion as the green subject has been photographed in the green negative. But, as we have seen, the amount of green light reflected by green objects rarely approaches the amount of green light reflected by a white, and it therefore follows that there must always be some considerable amount of crimson ink printing on the greens in order to render them accurately were the process correct.

This is an inherent part of the process and would present no difficulty if the superposed blue and yellow inks produced a green which reflected practically all the green light which fell upon it, but this, unfortunately, is not the case; the combination of the available yellow and blue inks produces a somewhat dark green, and the crimson degrades it still more. This is the chief cause which tends to mar the mechanical reproduction of greens.

An examination of the light reflected by the three-colour inks shows where the trouble occurs (fig. 2). Two of them, yellow and blue, should reflect green light well, while the third, the crimson, should absorb it. The blue ink does not reflect nearly as much green light as it should do.

As far as this aspect of the problem is concerned, it would seem that improvement should not be looked for in the filters or photographic plates, but better blue inks must, if possible, be obtained. In the meantime, where the effect is marked it must continue to be corrected by fine-etching.

That the failure is due only to the inks and not to either plates or filters is further borne out by the astonishing fidelity with which greens are rendered by additive methods such as the Kromskop and the Lumière Autochrome plate.

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Collotype—The Negative.

By Walter Griggs.

Avoiding "stronger etch"—Placing together for commercial work—Tinfoil—Two ways of arranging negatives for printing together—Film-stripping—An example of *modus operandi*.

In my preceding article the various characters of negatives and their fitness for their purposes were considered. I wish now to deal with their suitability and use for collotype printing—that method which is the first and finest of the photo-mechanical processes and whose products are difficult to distinguish from direct silver work.

Years ago, when little was understood of the process, attempts to unravel its mysteries were verily a groping in the dark. The long hours spent over the obdurate plate in the hand-press and the theories expounded on its intractability will not be forgotten by men involved in those trying experiences. With the passage of time there came increasing knowledge, revealing the faulty negative as the cause of the greater part of the trouble. The collotype process is now commercially successful: it follows practical rules, and it yields perfect machine-printed copies in large quantities.

A few preliminary observations may not be out of place before proceeding with technical details.

To get a fair return from the machine-room with as little delay as possible it is necessary to supply the "minder" with a plate from which he will be able to start printing without having recourse to "stronger etch" for his deeper shadows, or other "dodges." His time will be saved, to the advantage of his employers, and his quantity of printed work increased while the quality is uniformly maintained.

The negative retoucher with his training and knowledge manipulates the negative so as to ensure smooth, even working of the plate. He adjusts the balance of tones, subduing or increasing the effect in ratio as required, that the printing may proceed without a hitch. His refusal to leave anything to chance makes all the difference between loss and profit.

The Works Order Sheet expresses the amount of time estimated for each subject. It is in general a question of limitation, of choice between alternatives, as to what one shall do and what one shall leave alone—what is the minimum of labour for the maximum of effect. This limitation frequently varies as much as the subjects themselves. To a capable craftsman all this discrimination and decision become a second nature, and the work is cleared methodically and satisfactorily.

With high-class work the fullest time and attention are given to bring out value and character. Priceless old MSS. have the edges carefully painted down to preserve their irregularity, and are handled reverentially, so as to preserve the effects of age and antiquity. Highlights are correctly placed on old lace to give value to the design; quite special care is bestowed on the lighting effects when one is dealing with porcelain, china, and jewellery (with perhaps relief in the shadows through inserted detail), arms and armour, stained-glass windows, silk brocades, or old furniture and paintings.

In commercial, catalogue and similar work many articles are placed together

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on each page. The picture area is measured and ruled round—first with a lead pencil and then with a ruling pen and Indian ink. The margin is "blocked out" with opaque water colour, and when dry, covered with strips of thin tinfoil, the smallest amount of adhesive being used to keep it in its place, so as to ensure absolute contact with the sensitive plate. The tinfoil must be free from any accidental breaks through which light could penetrate. If preferred, the "blocking out" may be continued through the intervening spaces up to each article, obliterating all cast shadows. This method is adopted when the articles on the finished print are required to show clearly against a white background.

Post cards and other views and portraits, when placed together in large numbers for economical reproduction, are "squared" and tinfoiled for clean margins in the printing. In the better class of this work a considerable amount of retouching may be done, but in every instance all that is needful is added, as such "early and provident care" means labour-saving in the machine printing which follows.

Collotypes may be printed singly from, say, a quarter-plate to one that would fill a sheet 30 × 22, or larger; or two or more may be worked together to those dimensions. If these are in duplicate and the number of machine runs correspondingly reduced, a considerable gain on a large order is of course effected.

The number of plates printed together on each sheet is regulated by the paper size of each plate. In cases where margins are not required to the work—the pictures running to all extreme edges of the paper—numbers of negatives are arranged together, side by side; as many as the sheet will contain, less about one inch margin lengthwise for the gripper of the machine. The sheet must be first carefully ruled, giving the positions and the negatives carefully adjusted, so that they "butt" perfectly together. When printed the sheets pass to the warehouse for cutting up singly. For example, a sheet arranged as described, that had 40 subjects, 1000 run at the machine, would give 40,000 single pictures when cut up.

To prepare and arrange the negatives for printing together on one sheet, either of two methods may be followed. First, printing direct from the reversed negatives. When taking these negatives a mirror-box is used, which fits on to the front of the camera with the surface-silvered glass placed at an angle of 45° and the lens fitted to the front of the box. Or the plan adopted may be stripping the films from their original glass supports, reversed or not reversed negatives being equally serviceable and easy of manipulation. When it is proposed to strip valuable negatives belonging to customers in this latter manner it will be first necessary to secure their permission in case of an accident occurring to the film. For once in 100 to 500 times an accident may occur, though, to be sure, it should not if ordinary care is exercised. The films thus stripped can be returned to their original support in the same manner when the work is completed.

When you want to arrange original reversed glass negatives together without stripping, the number of subjects and size of picture surface, the paper size of each single subject and the number of these single sheets that will cut out of a stock size of paper, must all be determined. As an example, take subjects 7 × 5 on paper 10 × 7½ (crown 4to), print "4 on" a crown sheet 20 × 15 or "8 on" a double-

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crown sheet 30 x 20—and so on with other sizes of work and paper. Fold into four quarters or rule clearly with lead pencil and divide a 20 x 15 sheet of white paper into four equal divisions, each 10 x 7½. Within each of these four divisions measure the position the picture is to occupy, equal each side, and generally with a small extra allowance at the bottom of the picture to allow of a title being added later to the printed sheet if required. Cut out these inner spaces with a sharp knife, using a steel rule to cut by. Make a duplicate of this sheet, using strong brown paper of medium thickness—with the difference that the cut openings are about a quarter of an inch larger all round. A sheet of plate-glass is advantageous to work on: the sheet of white paper is first laid on this and kept in its position by using a small amount of gum at each corner. Over this the sheet of brown paper is placed which has the largest cut openings, and when adjusted exactly over the white sheet, is likewise kept in position by a small amount of gum.

The four glass negatives are placed, film side up, on this brown paper sheet or mask in such a manner—horizontally and vertically accurate—that if an artificial light, a candle, is placed under the glass at a safe distance, the illumined space will be exactly 7 x 5, the required picture size which has been cut out of the white sheet of paper.

Secure the negatives in their position by strips of tinfoil and a suitable adhesive (indiarubber solution), fastening the edges of the negatives to the brown paper. With the aid of the steel rule mark the 7 x 5 size of the picture on the film with a lead pencil and mask off the outer edges with thin tinfoil. When this is completed the gummed corners may be freed from the sheet of plate glass and the under sheet of white paper removed. As the thickness of these four negatives will vary, this brown paper sheet holding the four negatives is turned and laid face downwards on clean paper, and small pieces of rubber are fastened a half inch apart to the glass close to the cut openings of the brown paper. The rubber should be one-eighth of an inch thick and kept within the edge masked by the tinfoil on the film side. When these built-up negatives are placed with the prepared collotype plate in the frame for exposure (film side up), the rubber, yielding unequally to the pressure, brings the films of the negatives into absolute contact with the plate.

To arrange a number of stripped films in a given position on a sheet of plate glass is as certain and as excellent a working method as printing from the original glass negatives. Operators vary in their choice of alternatives.

As in the other method, a sheet of white paper, crown size 20 x 15, is folded into its four quarters or ruled and marked with a lead pencil in four equal divisions each 10 x 7½; the four spaces the pictures are to occupy, each 7 x 5, are measured within them. This sheet of paper is fastened by a little gum at each corner to a sheet of perfect plate glass ¼-inch thick and free from scratches or blemishes. The side with the pencil ruling is next to the glass. This is turned over and laid on a level bench, glass side uppermost. The films have now to be removed from their original glass supports and laid on the sheet of plate glass exactly over the spaces they are to occupy. These negatives have been previously soaked in a dish of pure formalin for fifteen to twenty minutes to harden the films and prevent them stretching in the after operations.

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The dish should be of a suitable size, and a few ounces of formalin will be sufficient to cover the negative.

After removal from the formalin the negative must be perfectly dried, at a safe distance from a gas ring or stove. When dry, place in a dish containing water 30 ounces and hydrofluoric acid 6 ounces. In a short time the film will be freed from the glass and float in the water. Using the glass to support it, remove it to a dish of clean water, and in five minutes to another, to cleanse it from all trace of acid. Have ready, dissolved, a weak solution of gelatine and water 1 to 40, filtered and free from bubbles; pour about two ounces on the plate glass where a film is to be placed. Lift the film carefully from the dish to the plate glass (the correct side uppermost). Move it gently till it is in register over the measured space it is to occupy. Cover with a sheet of blotting paper, using first the left hand and then the right to hold it and the film lightly and firmly in their position. With the lower part of the disengaged hand acting as a squeegee, working from the centre of the film in all directions, remove the surplus of diluted gelatine water. Repeat this in the case of the remaining three negatives one at a time, and allow them to dry spontaneously. When dry, retouch, rule round with pencil the picture limits, and complete by placing tinfoil strips along the margins and the intervening spaces.

Hints for the Technical and Commercial Photographer.

By W. J. Smith.

Wanted, a Paragon Paradox—most prints, shortest time—his proper camera—his lenses—their interchangeability—colour-screen ignorance—lights—architectural—groups—copying documents—sere and yellow leaves—and stained—reproducing bromide prints.

THERE are specialists in every branch of photography, but the commercial photographer is expected to carry out successfully any of the branches. On account of the varied nature of the work his duties are far from easy. To be successful he must be no "ordinary photographer," but one who is always learning and always striving to become a master of his craft. The commercial photographer must in truth be an active man, broad-minded, tactful, intelligent, with a plentiful store of saving common-sense and early and provident forethought. He must be quick to understand his customers' requirements, and able to execute them in a practical business-like manner. He must be almost a paradox as well as something of a paragon; for he must be methodical, but not a slave to method. Otherwise his work will become mechanical, and that will be fatal, since his duties are always varying and are carried out under all sorts of conditions, and particularly under all sorts of lightings.

A photographer, in short, is not recommended to undertake the work of technical photography unless he has an abundance of business capacity; unless he is almost two men. The combination of an up-to-date man of business possessing a bowing acquaintance with photography with a man having a thorough knowledge of photography and a bowing

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acquaintance with business, is an ideal condition. It is assumed that both work in harmony.

The commercial photographer must understand the most suitable sensitive plate and the printing process to employ for each class of work (the numerous dry plate companies supply plates for every purpose). His negatives must be of first-class commercial quality, by which description we mean negatives from which the greatest amount of prints can be taken in the shortest amount of time. If the negatives are not of this required quality, suitable intensification or reduction must be resorted to, so as to bring them as near as possible approaching the quality.

The sizes of cameras to purchase will depend upon the class of work to be undertaken and the contents of the photographer's pocket. A 15 × 12 or 12 × 10 square form camera of solid make on a firm stand will prove useful in gallery, architectural, and copying work of important nature. For general all-round purposes what will prove the most useful will be a $\frac{1}{1}$ size camera having all the following movements, viz.:—

Good rising front.
Swing back and front.
Triple extension (when this is used it must be perfectly rigid).
Focussing both back and front.

A half-plate focal-plane camera of the reflex variety is useful for press work and photographing sports, animals, and the like. An enlarging apparatus of $\frac{1}{1}$ size is desirable for bromide enlarging, making enlarged negatives, and other purposes.

Our commercial photographer should have a supply of lenses of different foci and a thorough knowledge of their use and their application to the work on hand. They should be of the best he can afford. Good anastigmat lenses are usually interchangeable on different sized cameras; viz. half-plate lens of $6\frac{1}{2}$-inch focus will act when stopped down as a wide angle on whole-plate. A whole-plate lens of 10- or 11-inch focus will be a long focus on a half-plate; and so on for different sizes.

A full supply of colour screens and how to apply them to obtain the best results is another necessity, and a very important one. The ignorance shown by photographers in this connection is surprising.

The usual class of work will come constantly to hand—such work as photographing exteriors and interiors. The negative for the latter work should be a bright one (the brightness must not be obtained by under-exposure and over-development), therefore the time of day must be considered, so that the sun shall be in the right quarter, striking the building at an angle of about 45°. Exterior work is best carried out if possible when the sun is shining, and interior work when the light is diffused. Special Rapid or orthochromatic backed are the plates suitable for this work.

For exteriors, if traffic is occasionally passing, a process plate can be used and the lens stopped down to *f*/64 and a long exposure given. The passing traffic will not show. The prints should be made upon glossy bromide or P.O.P.; if they are to be supplied unmounted the thick variety can be selected.

Photographs of groups form another usual class of work. Special Rapid plates are the plates to use for the work. Whole-plate negatives can be enlarged to 12 × 10 or 15 × 12. Smooth fast bromide paper gives very pleasing effects and is easy to retouch, Indian ink or ivory black being used for this purpose, toned down with

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Chinese white for greys. This paper also tones to a good sepia.

The copying work carried out in the studio is pretty sure sooner or later to include the copying of legal documents, manuscripts, old prints, and photographs. Such special copy can be divided into two classes—copying facsim. and copying to obtain a result superior to the original. When dealing with ordinary black-and-white work no difficulty should be experienced if a process plate is employed, developed in a hydrokinone developer giving strong contrasts. When the original is printed on hand-made paper or parchment the texture of the paper must be reproduced, and this can usually be obtained by photographing upon an ordinary plate (backed) with a lighting of about 45°; development being with pyro soda or metol hydrokinone. The latter negative should be printed upon a gaslight paper and the former upon a smooth-surface bromide paper.

When the original is an old yellow print slightly stained and a facsim. result is wanted, the plan of copying upon an ordinary plate, developing with pyro soda, and printing upon cream surface paper toned sepia will generally give a good reproduction of the original.

If the original is very yellow and the writing has faded to a brown colour, a yellow screen should be employed, coupled with a panchromatic plate. The stains and yellow tint will not show so pronounced as otherwise they would.

If the original is to be so copied that the yellow stains and age shall not show at all, a good exposure should be made upon a process plate, developed up well with hydrokinone, with slight reduction and intensification. This will generally achieve the desired end. This latter hint applies to copying faded and yellow albumen prints.

Bromide prints are difficult originals to reproduce and should be softly lighted with a front light, and a one per cent. sulphate of quinine filter should be used, coupled with an ordinary plate. The filter mentioned will absorb the ultra-violet light and a truer rendering of the original can be obtained. The sulphate of quinine filter is a liquid one, and consists of a one per cent. solution of quinine sulphate in water, a few drops of acetic acid being added until the flocculent deposit is dissolved and the solution clear.

This filter is useful when photographing originals worked up with Chinese white. Without the filter the pigment photographs in a grey tone, but when a filter is employed it will reproduce quite white.

(To be concluded.)

WHEN the *Todmorden Advertiser* lately suffered the disaster of a very bad fire the engraver was called in to save the situation. The editor has taken the public into his confidence to some extent. Todmorden learnt that the fire had consumed, *inter alia*, "four solid pages of type of the preceding day's paper—equivalent according to printers' calculations to a fount of type of about 1100 pounds of loose letters. The four formes included the railway time-table (set in small type and in tabular form), also nearly a page of standing advertisements—many of them with blocks which it would have been difficult, if not impossible, to replace within five days. In this connection a happy inspiration occurred to Mr. Lee, the proprietor. It came in a moment, and was instantly acted upon. All those parts of the four pages which needed to reappear in future issues were sent off to an expert firm of engravers to be photographed and then reproduced by their wonderful process, and this, we (*Todmorden Advertiser*) venture to think, is an unique—possibly an unprecedented—application of the art."

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Are Blockmakers the Legitimate Three-colour Printers?

By J. R. Riddell.

OUR readers will recall many useful counsels regarding the half-tone block from the printer's point of view, which were prepared especially for our columns by Mr. J. R. Riddell, printing manager of the great newspaper—letterpress—litho-engraving establishment of Messrs. Forman of Nottingham. We have long felt that Mr. Riddell's experience of the craft in various parts of this country, his observations during American business travel, his study of detail, and in general his observing and critical habit of mind, give exceptional value to his trade utterances. With that feeling we append, with his goodwill, a condensation of an article he has contributed to the current *British Printer* on the question embodied in the heading. It will be seen that Mr. Riddell is keen upon each worker sticking to what he considers his "legitimate": on the printer being made responsible for the printing of process blocks, and a responsibility to which Mr. Riddell suggests the printer's high attainments in process developments show him to be quite equal. That is a negative side of his pronouncement. There is a positive side: he thinks the printer and engraver, avoiding each other's functions as far as possible, may develop relations of much heartier and more intimate co-operation. We should not think it seemly to reproduce the article fully, but here is a blend, partly excerpt and partly condensation: Mr. Riddell is treating of a previous communication on this subject by Mr. Noble.

Many of the supposed advantages mentioned by Mr. Noble, when analysed, are in reality the results of the shortcomings and poor workmanship of the engraver. The situation was well summed up a few years ago by a gentleman who said that, in his opinion, for the engraver to put down a printing plant to compete with his best customers (the printers) was a suicidal policy—nay, further, it was acknowledging a weakness in that firm's production that they should find it necessary to maintain an expensive plant and labour to obtain results from their own plates.

The "commercial printer" is able to produce better process colour work to-day than he was a few years ago, and when he specialises in this class of work he is more than able to hold his own, even against the engraver's "faked" proofs. The suggestion that process firms are prepared to lose on the platemaking to secure the printing order, as the most remunerative branch of the business, does not reflect credit on the business methods of the engraver.

The implied suggestion that process firms do not put their best work into plates supplied to customers, owing to the price, is a serious one. The charges made are according to their own scale, therefore if the scale does not allow them to supply the highest grade of workmanship, surely it is their duty to "get together" and formulate a scale that will enable them to produce good work.

Still there may be some ground for this suggestion, as it is within the writer's experience that blocks have been supplied

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to publishers who order their own printing material so poor in quality that it takes the prover all his time to get a decent proof, so that the publishers might pass the work themselves before handing over the blocks to the printer, the latter being expected to work up to the engraver's proof. Such firms would scarcely dare supply blocks in the same condition to a firm of printers who specialise in process work.

Many customers recognise that to hand over the responsibility of production to the printer ensures the best work, both in quality and price. He would be a bold man who would deny that printers have had very much to do with raising the standard of process colour work. Some colour printers have put in hand most ambitious subjects undreamt of by the engraver, demanding the best possible work irrespective of price, and by their encouragement, knowledge of colour, and practical experience, assisting the engraver to reach the desired end.

Let the engraver stick to his legitimate business of producing plates, dispensing with all rule-of-thumb methods but introducing science, and bring that science down to practical rules; he has still plenty of scope in his art.

This gives the writer another opportunity of putting forward the plea which he has been making for years—that a closer touch and better understanding should exist between engraver and printer. Each have their difficulties, which, when appreciated by the others, would do much to overcome the limitations of "process."

But to get back to Mr. Noble's article. The other points raised are technical ones, and might be answered by making the suggestion that the engraver ought to try to standardise his materials and methods of work. For instance, he might use only one gauge of copper, and that of the best; he might aim at getting each subject to carry the same amount of ink, and prove in "standard colours" which are known and recognised. This is not a "theoretical vapouring," but is practised in America, where they work extremely large sheets of colour work, and no one can deny that the American reproductions are usually strong, full of colour and, above all, clean in the highlights and three-quarter tones—in fact, a reproduction to arrest attention and always "saleable"; but, to be fair, the American usually eliminates that faddy person with whom we are so much troubled, "the artist."

The difficulty of printing many subjects on a sheet is a real one, but the fault to a great extent lies with the engraver. His aim should be to get the best possible negative, and when etching take care that the "tone" is "kept up," so that the finished printing plate will carry as little ink as possible, at the same time getting the "solids" firm and keeping the lights clean. This will ensure clean working and often obviate any necessity to interleave the work. If means were taken to standardise the "plate tones" and the amount of ink carried on every subject, we would hear less of the irregularity of process colour work.

Further, Mr. Noble suggests that alterations can be done when the job is on the machine. This may be possible, but consider the expense of the machine standing idle whilst the alterations are being carried out; and the risks must also be taken into account, for most printers know that no etcher can exactly determine the results when re-etching or burnishing a plate. It is no unusual occurrence to find, when a "local application" is required, that the whole plate has

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been affected, often impairing the printing qualities and changing the finished results to the extent that the customer would be within his right in refusing the job, it not being equal to the passed proof. If it is possible to alter plates on the machine so that a number of subjects can be worked together, it is just as possible to get the same results in the early stages of making the plates—by standardisation—which would be the more businesslike way of doing it.

Engravers should use standard colours only. It is one of the fundamental principles of the process that a recognised standard should be adhered to. It is very tempting to tone a colour to suit a particular subject so that the proof may be passed, but no one, not even the "printer-engraver," can print two or three different tones at the same time on one sheet. Again, excessive rolling is quite a usual thing in proving; it is but a simple matter to get "solid full" and high-lights clean, and a "flat" plate presentable, by double or triple rolling. But printers cannot resort to this, nor can they work the extra full-bodied ink, and seldom are they supplied with the high grade of proving paper used in proving process work.

Just another point for the engraver to consider. It is not an unusual occurrence for the printer to be supplied with colour sheets which do not correspond with the plates nor the passed proofs. This is a serious matter, especially when he does not prove the job, and certainly care ought to be taken to send in colour sheets agreeing with the passed proof and plates.

Finally, the engraver would be well advised to "get into line" with the Master Printers' Associations. There are signs that the Associations will take up questions of the day with a renewed vigour, and one of the things they must deal with will be their relations with the "supply" man. One other point for the engraver to bear in mind. There has been more than one process killed by attempted "combine"; so it is only business policy for the printers to retaliate if the engravers solicit orders from the printers' customers. This will not be done by installing a process plant, as printers are no more successful with their process plants than process firms are with their printing departments, but by encouraging the lithographer to perfect and put on a practical basis process litho; and the engraver will not be called upon to supply the negative or plate, for a large outfit and expensive labour is not required, and there are few firms but could afford the outlay. It is also well to remember that the lithographer is not the slow, "stick-in-the-mud" conservative individual he was a few years ago.

THE new stamps have certainly not found favour at the outset. It may be the public will take more kindly to them after a little experience, but we doubt it; at any rate we doubt its ever appreciating the designs of stamps of the denominations we have so far examined. Examining a halfpenny stamp bearing King Edward's image, we see that it is an excellent likeness. That certainly cannot be said of the corresponding George V. stamp. The public would not complain if the deviation from vraisemblance were a trifle on the side of flattery, for each nation might pardonably like to think it had the handsomest king in the world. But this figure with its receding chin is certainly anything but a courtier in stamps. We should say it does a great injustice to the sovereign. The questions to Mr. Samuel on the subject in Parliament and his answers cannot have been very consoling to the contractors, though, to be sure, the Postmaster-General, while avowing his disappointment, disclaimed any intention of requiring a new design forthwith.

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Facings and Pacings.

By "Ion."

I SUPPOSE the poor electrotyper must never expect his due. The public know little enough about the making of an original plate, and practically nothing about duplicating; certainly next to nothing about that wonderful work in duplicating plates of which the Coronation specials are the evidence.

The long runs which have had to be made in these crowded days of June would of course have been quite unthinkable but for the foundry. I have handled pretty well every Coronation *Special* which has had any real ambition, particularly those which have done good colour work, and I have not lit anywhere upon a case of really bad register. The *Sphere's* front cover was a very distinct triumph for the electrotyper. Such triumphs may be common enough in the best office, but must not be taken for granted. Any who has worked inside a foundry knows how easily things may go wrong.

Of course there has been in this instance some opportunity to make plans ahead. It was the appalling strain and overstrain upon the foundries which suddenly arose upon the unexpected death of King Edward which peculiarly evidenced how well they can rise to a great need.

There have been some personal changes in the trade union organisation affecting the duplicating crafts; not, however, involving or implying any important modification of policy. By the way, it was decided several weeks ago by the unions that any foundry men who were out of work in connection with the hours dispute might return to work without waiting till all members of trade unions in allied trades acting in concert in the movement had also returned. It was, however, an understanding that such return to work was not to be upon the basis of any longer week than 50 hours; apart, of course, from overtime.

Messrs. Manning & Son are to be congratulated that the outbreak of fire upon their premises in Old Street, E.C., was controlled so well. The fire risk of a foundry is perhaps less than it used to be.

It somewhat depends on the location of the black shop. This is normally a trying place in regard to temperature. I have known men sweltering away in 120° heat in the London East Central district. One thing that has impressed me has been as to how thoroughly the fire insuring offices sometimes study the precise risks of such a works as an electric foundry. You will probably find, if you have occasion to visit the assuring office, that it has a plan of each important floor of your premises, probably with what it deems the danger spots marked in red. I have known of cases where some metal sheeting was very badly needed as a protection around some such danger-spot—the scouring board, for an instance—and yet such sheeting long remained unprovided. Quite possibly the foundry was paying a somewhat needlessly high premium because of this little negligence.

While on this subject it is quite possible that a few shillings of carpentering work would greatly increase the likelihood and might effect the virtual certainty of the escape of all workers upon a roof in case of a very bad fire. I am aware how insistent the authorities are in the matter of iron staircases and so on, but there are instances where such provision does not

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present itself, even to the most enacting officials, as necessary or perhaps as structurally possible, and yet where a little bridging over of some small dip among gables may be most important and quite inexpensive.

The first Saturday in July is the traditional holiday in the foundry world. The holiday is like salt, described by the boy as the stuff "Wot makes yer taters taste nasty when yer ain't got any." Day outings make workadays taste nasty when yer ain't got any. "A Christmas feasting," says Walter Scott, "oft would cheer the poor man's heart through half a year." The electrotyper is not a poor man, as journeymen go; still he needs all the zest and relish deriving from these annual amenities. Directors and journeymen meet sometimes round these tables who have no other contact in the year. That infrequency of intercourse is not good business, perhaps, but it would be still worse business that they should not meet at all. So here's to the good old custom, and may every foundry staff take note that I was with them in spirit on July 1st.

There is not much to chronicle or suggest, perhaps, regarding the way in which the hours alteration is affecting the duplicating trade, but it must be borne in mind that it has meant necessarily somewhat increased expense, and that expense has somehow to be recovered from the customer.

Is a proof always sent to the foundry with the type formes? Theoretically yes, no doubt. But practically . . . ? Tabular work in which a mistake might easily cause the return of the job on the printer's hands will sometimes be sent along without such a proof safeguard. I have known the case of a large insurance company's form electro'd, printed from, and the whole job returned to the printer with instruction to cancel his invoice of twenty or thirty pounds, the reason being that the office could not stomach the occurrence of "payable at date" instead of "payable at death" in its tables. When was the word pied and wrongly set? "In the foundry," said the printer. The foundry looked for the proof; the printer had not sent one. The foundry sent to the printer for the last proof available. It was brought down; a large sheet folio lengthwise, with perhaps two square feet or more of tabular work. It bore only one mark for correction. There had been a literal in the line next above the line where this "payable at death" had subsequently gone wrong. There had been no correction in that line itself, but the conclusion was irresistible that when the line next above it was attended to, the line below was pied, and a stupid compositor, inattentive to the sense, picked up "a" and "t" and "e," and not noticing an "h," set the word "date."

A trouble to which foundries are always liable in the matter of three-colour duplication is the wrong marking of an electro, the "Y" for the "R" or the "B," and so on. The moral and remedy are simple; they should require the customer regularly or often sending such three-colour originals to mark boldly, and as indelibly as may be, on side or back of the block the identifying letter, an initial for red or yellow or blue. His marking such identification on a paper wrapper around his original is not good enough. The wrappers may get lost or mixed up and the job will be half-worked though, very likely, before the cause of the poor result is properly traced.

Mr. Gamble's interesting paper regarding experimental work in electrotyping, or,

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more particularly, work to test the value in the present day of some old processes, is one which should not be forgotten. Perhaps the quieter months between June and October would be the most favourable to some little effort along this line.

I am well aware that the adventure of the electrotyper into new fields has not been encouraged so far quite as well as one could have wished. But life is full of pleasant as well as of unpleasant surprises. "One cannot tell which shall prosper, this or that." On the whole, the law of averages is a great comfort, like Mesopotamia.

Does the trade as a whole make full avail of the Central Foundation School's electrotyping workshop at Cowper Street, Finsbury, E.C., so long associated with the great name of Professor Silvanus Thompson? Use has been made, no doubt, many a time and often, of the willinghood of the College to let its electrotyping head undertake some research or experimental work for which there was too scant opportunity or which was otherwise impracticable for the trade workshop; but I used to think that more might be done in this way. It is a good job that there is such a place in the platemaking in the trade. Why not make the best of good jobs as well as make the best of a bad job?

Intaglio and "Offset" Colours Combined.

A PATENT, No. 25,870 of 1910, has been granted to H. Bendixson and J. Widdop for "an invention having for its object to produce colour prints at a high speed at a low cost and of a kind not hitherto attained. The invention consists in preparing a suitable monochrome photogravure by rotary gravure intaglio printing, and subsequently applying colours thereto by a lithographic process. . . . In this manner a high-class colour print, having as basis a monochrome gravure with the colours applied by lithography, is obtained, and at a cheap cost, because the cost of producing gravures by a rotary process and colouring them by lithography is small, especially if rotary or offset lithographic processes be adopted."

Commenting upon this patent, the writer of "Photo-mechanical Notes" in the *British Journal of Photography* says: "The process of combining monochrome photogravure with colour from lithographic surfaces is not new, and is generally mentioned when combination printing is being discussed. Full description of methods of doing this have appeared in various textbooks and articles —for example, in Fritz's *Handbuch der Lithographie*, 1901, also Brandlmayr in *Photographische Korrespondenz* in 1899, and Unger in last year's Eder's *Jahrbuch*. Nor, surely, can the combination of rotary photogravure with litho, or even offset litho, be claimed as any novelty, since in the *Process Year Book* of 1909 the editor says on page 10: 'In our opinion, the processses of the immediate future will be rotary intaglio and offset litho, or a combination of both, with the chances greatly in favour of the last-mentioned process.'"

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The Polarisation of Light.

A Graphic Lecture by Mr. Arthur Brackett, F.I.A.

(*Concluded.*)

Do you "opaque"?—The two-sided beam—Iceland spar's 100 per cent. dividend—The wily quartz—Methods of polarisation—Blue waves, the shortest and smallest—The companionable nicol — 1,000,000,000,000,000,000 revolutions a second—The gamut of æther waves—Octave relations—Sound and colour.

HAD we the time, it might not be uninteresting to follow the analogy of polarity, or, as it is sometimes called, "enantiomorphism"—the state of opposite or opposing forms. Even human beings are not without a trace of it. The polarity which the would-be purchaser of an article has towards his purchase changes as completely after he has become the owner as the appearance of a patch of polarised light changes with a twist of the Iceland spar. The purchaser then becomes opaque to the faults of his new possession as he was just before to its merits, and no Iceland spar or any other prism has yet been discovered which will correct this tendency to polarity.

Long before the time of Malthus, Sir Isaac Newton had put this question in his *Optics*: Have not the rays of light different sides endowed with different and original properties? He, too, had been studying the changes which a ray of light met with in its passage through a piece of Iceland spar, and he, too, had compared the two-sidedness of the beam of light to the two-endedness of a magnet, known as its polarity.

The Structure of Crystals.

There are various minerals and other transparent crystals that appear to be without structure of any kind. We can see through them as clearly in one direction as in another. They are not, nevertheless, the shapeless, structureless, amorphous substances that they appear to our unaided vision. They have a definite, though, to us, invisible structure. They are built up round some centre, and have as symmetrical a composition as, say, the trunk of a tree. This structure may, moreover, be even more complex, and be endowed with some very remarkable properties. Iceland spar is such a crystal. If a ray of light is sent through it, it promptly splits it in two, and if we look through a rhomb of Iceland spar we shall see double. Place it over a sixpenny piece, and you see change for a shilling on the table. With a piece of Iceland spar, the ray coming from the lantern will be split up into two rays.

Stains in Glass.

It is a common experience with housekeepers for a glass tumbler to fly to pieces in frosty weather, especially if it is standing on a cold mantelpiece. If the tumbler is imperfectly annealed, the interior of the glass is in a state of great strain, and the additional strain caused by the expansion or contraction due to additional heat or cold is more than it can bear. By using polarised light, these internal strains can be seen although they are invisible to the unaided eye. Two examples of what appears to be perfectly clear plate glass will be shown, and the polariscope will enable us to see that the glass is in a most uncomfortable condition of strain.

Interference.

Quartz, another of these clear, innocent-looking minerals, will receive a ray of

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light and split it up into rays, one of which will come corkscrewing out of the crystal with its waves revolving with a right-handed screw, or the direction in which the hands of a clock move, and the other rotating in an opposite direction. There is also this further complication caused by the wily quartz, for what is known as a "difference of phase" has taken place, and the waves of one half of the ray have lagged slightly behind the other half, as a result of which they tend at times to amplify each other, and at times to extinguish each other altogether. It will be realised that as the white light consists of waves of many lengths, the extinguishing of some and the reinforcing of others will produce colour, and this will be seen in a later experiment.

Double Refraction.

Ordinary refraction has already been dealt with, but in certain substances, such as Iceland spar, light is split up into two rays, so a "double refraction" takes place. The ray of light, in passing through a prism of Iceland spar, is split up into two rays. Both rays are polarised, but one has traversed the crystal with greater rapidity than the other, and although both rays are plane polarised, one is at right angles to the other. Here we have an admirable arrangement for obtaining polarised light, but—we have too much of it. Nicol devised a plan by which, in consequence of the splitting in two and subsequent cementing together of the prism with Canada balsam, one of the rays (the ordinary) is totally reflected, and so got rid of, and the other ray only (the extra-ordinary) passes through the prism. The prism is called, after its inventor, a Nicol prism, or "nicol." In the polariscope which is being shown to-night the light is first polarised by reflection at a certain angle, known as the polarising angle. A nicol is placed in the tube, and the polarised ray can only pass through that when the nicol is in one particular position. In the polariscope fitted to the microscopes that are sometimes seen here, the first polarisation of the ray is also obtained by a nicol, but Iceland spar is a scarce and costly mineral, and a crystal large enough to effect the first polarisation is exceedingly difficult to obtain. In the microscope the first nicol is called the polariser and the second nicol the analyser, because by it the condition of the ray of light is analysed. By revolving the analyser the polarised ray is alternately extinguished or allowed to pass exactly as the polarised ray was extinguished by the second tourmaline, or allowed to pass through it, according to its position.

Methods of Polarisation.

The four principal processes by means of which a ray of light may be polarised are—

(1) Reflection.
(2) Ordinary refraction.
(3) Double refraction.
(4) Scattering by small particles.

By one or other of these methods three kinds of polarisation may be produced.

Varieties of Polarisation.

(1) Plane polarisation, such as that produced by the tourmaline, in which the waves are in one and the same plane throughout the entire ray.

(2) Circular polarisation, in which the movements of the waves are all circular.

(3) Elliptical polarisation, in which they are elliptical.

Why the Sky is Blue.

The fourth method of polarisation, viz. scattering by small particles, involves a

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different principle. The newspapers have of late contained advertisements imploring the reader for information as to why the sky is blue, and suggesting that he should turn to a particular article by Lord Rayleigh in a new work for the explanation. The fact that the sky is blue, and not dead black, is due to the last-named method of polarisation. Tyndall has shown that the light reflected laterally from any particles whatever that are sufficiently small is both polarised and of a blue colour. The dust in the air is sufficiently small, and it is easy to understand why the resulting colour is blue. The blue waves in light, as we have already seen, are the shortest and smallest. Hence, from particles so small as to be in commensurable relations with them the smaller waves may be wholly reflected, while the larger ones are broken up, shivered into fragments, as it were, and destroyed, in the same way, points out Tyndall, as "pebbles on a shore reflect small ripples entire, whilst they scatter and break larger ones."

When we remember the cause of refraction or the bending of light by a transparent object, and the method in which light is polarised by it, it will be obvious, as we have already seen, that the structure of all such transparent bodies can be investigated by the aid of polarised light. The stress borne by the various parts of a crystal varies in the way in which it is built up, and polarised light is transmitted through or extinguished by it, according to its structure. In the same way the structure of bodies which could not otherwise have been even guessed at is clearly shown.

Until one has actually tested it, it is astonishing to find out how much of what appears to be ordinary light is polarised. A nicol is a most instructive companion on a country walk. Almost all the light reflected from the leaves of trees will be found to be polarised, and if the country on a sunny day be viewed through a nicol, an extraordinary change will be found to come over it. With the polarised light shut out from the eye, the brilliance of the summer landscape is gone.

The Threshold of Mystery.

With these investigations we stand on the threshold of mystery. The gigantic numbers and incredible speeds to be found in Nature are appalling. On the one hand are the almost countless numbers of the stars. On a clear, frosty night we can see at most about 6000 stars. The telescope reveals about 100,000; large numbers of them, centres of gigantic systems like the one of which our sun is the centre. On the other hand, the atoms are centres of tiny systems moving with even more astounding speeds. The electron of iron makes a trillion, that is, 1,000,000,000,000,000,000, revolutions in a second. An ordinary playing card is about $\frac{1}{50}$ of an inch in thickness. It would take 1000 of the waves of violet light to reach across the edge of the card, or about 600 of the red-light waves. Some of the bacteria are about the length of two violet waves; that is to say, 500 of them would form a procession across the edge of a playing card, but they possess toxic powers so potent that the various drugs obtained from dead bacteria are given in exceedingly small quantities. Of one we hear that a grain will furnish a dose for every man, woman, or child in a town like Eastbourne, whilst another has so highly active and toxic a character that even a millionth of a gramme has a tremendous effect on the heart. The speed

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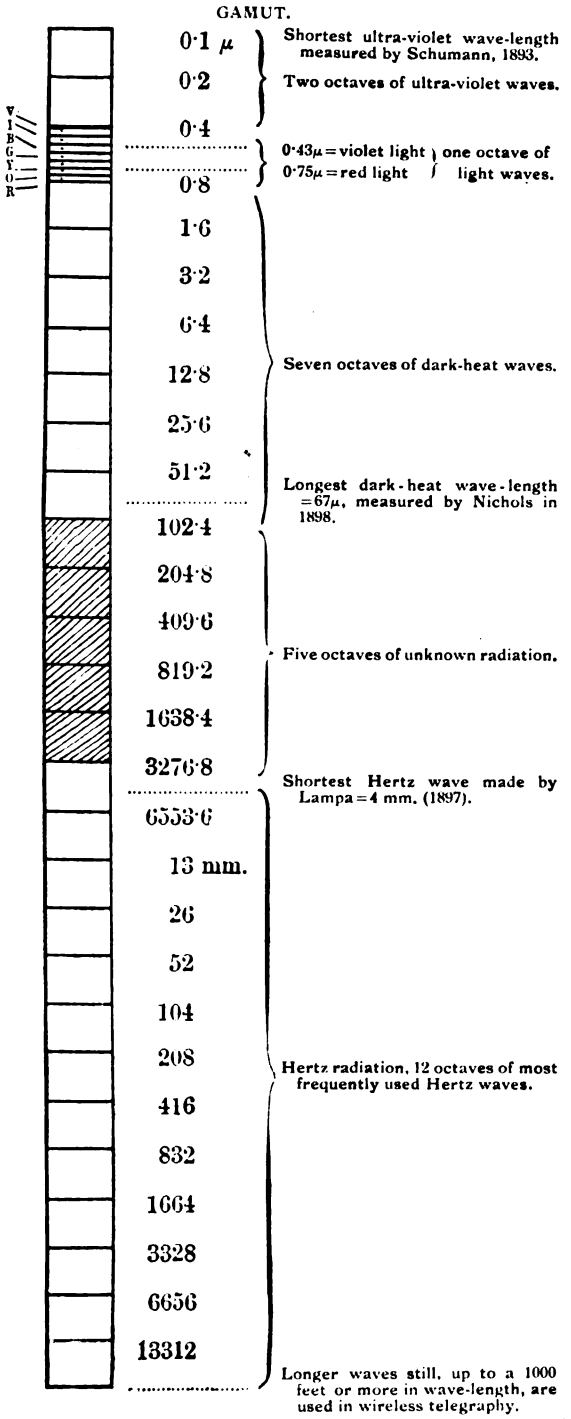

of electricity is such that telegraphists can divide up a second amongst themselves, each taking one particular part of each particular second, and send a number of messages along the same wire at practically the same time.

A Transformed Universe.

It may be that when our knowledge of the ultimate parts of matter is complete, we shall find that many of those things that puzzle us now are made clear; that hypnotism and telepathy do exist, and are to be explained by laws that can be formulated with as much certainty as the law of gravity; that the soul of man and life itself are subject to such laws, and that matter in its highest form is not confined to this existence, but extends to the life beyond. "It may well be," said the late Sir Edwin Arnold, "that the next great secret of existence is hidden from us by a veil so thin that its very thinness makes it impenetrable. A touch, a turn, a change as slight as when the light pebble lying on the thin ice feels it melt and falls to the bottom, may be all that is necessary to lift the curtain of another and utterly transformed universe, which is yet not really another, but this same one that we see imperfectly with present eyes and think timidly with present thoughts."

We have to make acknowledgment to Mr. Brackett for permission to reproduce this most illuminating address. He has obliged us further by sending an illustration in diagram form of the gamut of ether waves; the wave-lengths expression being in terms of the micron. The micron (signified here by the Greek μ) is the one-thousandth part of the millimetre. With this introduction the gamut may speak for itself.—Ed.

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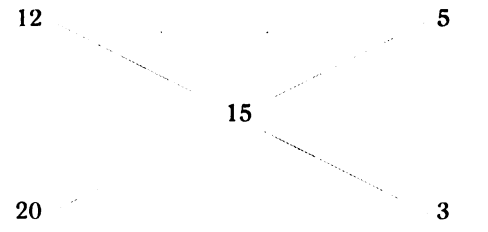
Mixture of Collodions.

A PROBLEM which is frequently met with by operators is the determination of the proportions which they should take to mix two collodions of a known concentration in order to prepare a collodion of a required intermediate concentration. A very simple rule will enable these proportions to be easily determined. Supposing one has to prepare a collodion 15 per 1000 by a mixture of collodion of 12 and one of 20 per 1000, we should write, as below, the two first concentrations and the concentration desired, and then the differences between those numbers. We should then know that we ought to mix five volumes of collodion at 12 per 1000 and three volumes at 20 per 1000 to obtain eight volumes of collodion at 15 per 1000.



— L. QUATREBŒUFS, in *Le Procédé*, May 1911.

When Instructions seem Impracticable: Some Ways round Difficulties.

A "PRINTING ART" writer has been pointing out that sometimes instructions to engravers transgress certain rules which experience has proven cannot be violated with impunity. In the retouching of photographs of this class of subjects there is the widest latitude for the artist to exercise his knowledge of light and shade, both as to the object itself and the vignette background or accessories. But if the lines of the object, the relative proportion of the parts, or the perspective, are false, it is practically impossible to alter them successfully to give a pleasing result.

Our critic proceeds that "most distorted photographs are due to the use of the wrong lens, placing the camera too close to the object or neglecting to have the ground-glass, when focussing, on a plane parallel to the vertical lines of the machine; the two former causing the foreground to be disproportionately large in relation to the more distant parts and also distorting pulleys, etc., and the latter causing the vertical lines of the machine to converge instead of being parallel.

"As the normal eye sees clearly what is included in an angle of sixty degrees, with a long-focus camera set at such a distance as to include the greatest length of the machine within lines enclosing sixty degrees from the lens, correct perspective is assured. A little figuring will show that a point distant twice the length of the machine will approximate the proper position. Vertical lines will be found parallel on the photograph, if the simple expedient is used, of placing a level on the camera.

"It frequently happens that some essential device is hidden which it would be highly desirable to show. This problem is solved by showing the intercepting parts transparent. This should not be attempted if there are several parts between the hidden device and the spectator. It is often done, but the result is confusing, requiring a familiarity with the detailed construction of the machine which it is not safe to assume is possessed by the prospective customer.

"Another method of showing hidden parts is to break away all intervening parts. This results generally in a confusing and inattractive result. In the opinion of experts on mechanical illustration, the best means to the desired end is to have an attractive picture of the machine or apparatus and use mechanical sections, copied from the shop drawings, but shaded with photographic effects, to make clear anything not shown by the exterior view."

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My Causerie.

ONE of the most interesting features of the Coronation specials has been the rather timorous but yet successful outreach after offset and photogravure. On the rough linen-faced cream-coloured cover of the *Ladies' Field*, for instance, there is an advertisement of the Daimler motor car which is printed by offset in colour. This Daimler is thus "exceeding the limit" that has so far seemed to be accepted as practicable for coloured advertisements in journals.

This wonderful journal also gave us a supplement with about a score of advertisements mostly in three-colour. To many of its readers there was probably novelty in the way a monochrome was inset in a three-colour border or surround. There might be some pictorial of a "human interest" incident; or perhaps (as in a boot advertisement case) the actual goods sold might be depicted in a black or a blue centre within the three-coloured border. Besides the advertisements the *Ladies' Field* has given us a sheaf of fashion studies. I say "besides," for I suppose they are not advertisements, though, as Bernard Shaw reminds us, you never can tell. Lovely colour dreams the ladies all are: broad at the hat and tadpoling away small by degrees and beautifully less.

The *Sphere* has scored in the literary matter which tells of English coronation incidents over a long review of centuries. There have been great pains to get good subjects to reproduce. Fine old pictures, grave or gay. The colour work is all three-colour, except that there is a heavy gold working on the front of the cover, which by the way, is a very handsome heraldic composition.

Much water has flowed into "Say when" glasses since Herbert Ingram of the *Illustrated London News* rushed up in a cab to the Leightons' works by Red Lion Street, Holborn, in December 1855, and carted away to clamouring news agents sheets of the first colour printed illustrations ever published in a British journal. It mattered little that they lacked yet a working or two and that he left the poor colour printer, for aught he knew, meditating suicide. Some day a St. Gilbert Chesterton would arise with the great evangel that "Whatever is worth doing is worth doing badly," and coloured journalism was worth doing.

Stout-hearted old pioneer, he has long gone; I believe he was drowned in a North American lake, but as in the story of another who died on that great continent, his soul goes marching on. It is instinct in the Ingrams of to-day, and here is its expression in the Coronation "News," my favourite upon the whole of all the great numbers. I like the rich, reposeful wrapper, and the borders in particular are wonderful composite studies.

It is not all three-colour. There are full-page portraits of the King and Queen, which appear to be produced by a combination of rotary photogravure and offset, but as I am not sure of the latter part I will simply speak of it as a photogravure which I think will be right in any case. Five portraits of the Royal family are by chromolitho. Perhaps they do not all maintain quite the same high standard as was reached by Mr. Orford Smith when he produced for the Ingrams wholly by chromolitho "The Record Number of the Record Reign" at the Queen's Diamond Jubilee in 1897.

I have that number of the *Illustrated London News* as a treasured possession. It excelled in its composite borders, into which a great number of portraits were introduced. Its strength lay particularly in the skill with which faces of quite small size were made to carry the speaking image. Admittedly I am on the dangerous matter of differing, or possibly differing, taste. Enough just to enter my own reminder that no art which falls into comparative desuetude can with certainty be relied upon to yield at any moment when it chances to be called upon, its most triumphantly successful service.

Colour miniatures of the King and Queen on "prepared ivory" have been presented as part of the half-crown value offered by the *Gentlewoman*. These of course have been separately enwrapped, and very welcome they have undoubtedly been. The *Graphic* made a feature of a large three-colour half-tone portrait of the King. It measured about 25 by 21 inches. He figures upon horseback, which gave the artist a good chance to make a noble ensemble. The *Graphic* preferred the shilling to the half-crown policy in this instance, and undoubtedly the sale of the series of special *Graphics* has been large. It attempted great things in fine and rapid engraving, and carried through its efforts with every success.

The Coronation number of *T.P.'s Magazine* has been a splendid issue with a handsome colour cover and abundant monochrome, including portraits of a number of very interesting personalities each specially well qualified to treat of "the outlook" in some one great department of

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thought, or art, or at any rate of human contemplation.

On the whole there has been an enormous amount of matter upon royal topics. The industry of editors in this one particular has been, as Dominie Sampson would have said, "Prodigious." I wonder if it has not been even a little overdone. Only there is the counter thought that really there seems to be nothing else just now that the public is deeply interested in. There is the Insurance Bill, of course; but you can't very well illustrate that.

The June *Pearson's* had a three-colour cover. The effect, I take it, was produced in two printings, the yellow of the cover serving for one of the ordinary workings, after the economical manner which the Shackell Edwards firm pressed on our notice a few years ago. (By the way, the effective use of yellow in the small coloured inset advertisements in some of these journals is quite one of the features of the time.) The letterpress includes an attractive illustrated recital of scenes in the life of the King. One of his hottest corners was evidently that in which he was set upon by about a dozen camera fiendettes as he was visiting a shrine near the old French village of St. Joachim, thirty miles from Quebec. "They" pressed round him with cameras, and we read that "some attempted to seize his hands." Well, many things are taken with good grace in the colonies which would be deemed altogether too dreadful here. But those new members of the National Union of Journalists, the press photographers, may feel that they are altogether left behind by the dainty damsels of Canada.

In the Coronation *Windsor Magazine* there is one page bedight with the various things of mystery, including the swords and sceptres and spurs which are used in the Coronation service, here reproduced to accompany an article by the Duke of Argyll. Very sensibly the plan of a black background was adopted. The *Windsor* has a successful colour plate of the King and Queen. The flesh tints are quite good. The *London*, like the rest, relies on a three-colour cover; in this case, of soldiers in a row presenting arms to royalty, with just a welcome addition of green foliage to the red uniforms.

FRANK COLEBROOK.

Safe-edging Half-tone Blocks: The Serviceableness of a Burr.

IT is a constant trouble in half-tone that certain conditions are liable to cause bad lights and vignetted edges. The dot may finish rather large, yet want of time or the limit of safe biting will not allow more to be done. Many things may conspire to make the light edge not light enough. Even with the edges hammered back with the toothed hammer or punch it will often finish off too suddenly. There remains, however, one valuable and very safe as well as easy system borrowed from the intaglio department, in which burr is made to serve. Just as burr holds ink on the copper plate, so burr will be found to refuse ink on the half-tone block, and the best way to produce burr that I ever found was by a sort of "many line" graver, using it nearly upright and striking the top with the flat-faced engraver's hammer. It must be moved back a little each blow, and very soon a sharp burr covers the portion operated upon. On applying the ink roller it will be found that the sharp points, being exact miniatures of rasp teeth, having practically no surface at all on their tops, take no appreciable ink, and print white in spite of much pressure.

The operation is so far safe and simple that it may be used in the middle parts of a picture where lights of larger or smaller size are wanted, and these lights will be found to stand out better than engraved lights, the sides being steeper.

Should it be apparent that the spot is too light, it is easy to flatten it a little, preferably with a small hammer having a slightly convex face, electrotyper's pattern, only very small. If, however, on the other hand the spot does not print light enough, it can be again burred by going over it at an angle with the former work, and a still rougher surface will be produced. The operator need not mind these burrs standing a little proud of the work. I never found any harm to come on that account.

I send for the editor's inspection a tool of the kind, 32 to the inch, and other sizes such as 40 or 50 can be made. The best width is ¼ inch to ⅜ inch. Of course they must be ground off a trifle convex, much as a mezzotint rocker.—By A. DAWSON, in *Process Work and Electrotyping*.

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Index of Current Literature. With Comments.

"LE PROCÉDÉ" for April has a long article on the Schulze screen, and reproduces the same pictures by the ordinary cross-line screen and the Schulze. The comparison, to our mind, does not tell in favour of the Schulze. The remainder of the journal is occupied with the translation of an article on "Colour Filters" by R. J. Wallace, and the various French patents granted to Mertens in connection with rotary photogravure.

Le Procédé for May deals with conditions for teaching apprentices approved by the Paris Chamber of Commerce, with the preparation of carbon tissues for photogravure printing on metal, with dry plates, and with development (by Dr. Mees).

The British and Colonial Printer and Stationer for June 1st has a long descriptive article on "The Photo-Gelatine Process," which means what is commonly called collotype. The statement that "a plate will stand several thousands of impressions," we fear, is not borne out in practice. The average edition from a collotype plate is only about 500.

The British and Colonial Printer and Stationer for June 15th has a summary, under "Photo-mechanical Printing," of C. W. Saalburg's English patents for rotary photogravure.

Process Work and Electrotyping for June reports further efforts of American engravers as to cost finding and price level; the note on securing light edges on half-tones that we reprint on another page; a description of a new guillotine; and an account of the installation of Messrs. Hulton & Co., London. The answers to questions this month deal with streaks on wet plates, film lifting on dry plates, trouble when etching face down, deepening newspaper blocks, vignetting half-tones, and reclaiming copper from old etching baths.

The Graphic Arts for May has among its specimens examples of offset colour work and of 400-line screen half-tone work. The article dealing with "The Graphic Arts in Mural Decoration" is of interest to photo-engravers.

The Printing Art, among its many specimens, has a page of line reproductions which are notable as showing the possibility of line drawings for interpretation. "India Paper," "Paper Sizes," and the "Principles of Selling Literature," are dealt with in the course of the articles.

The Inland Printer for June has hints on photo-engraving calico rolls, three-colour and the offset press, pencil drawings and the offset press, colour blockmaking and printing.

The British Journal of Photography for June 2nd has a note on the possibility of employers combining; and its issue of June 16th has a note on the Exhibition of Colour Prints at St. Bride, and on the testing of materials used in photo-engraving.

The Modern Lithographer (monthly) is running a series of articles by Mr. J. Goodman, "Photo-mechanical Processes and their Union with Lithography."

The Engraver and Electrotyper for June, like all the other American journals at the present, deals with price problems, though this publication, in common parlance, takes no stock in the efforts of Mr. Benedict or his colleagues to introduce a "scale" system. There is also a description of a new colour camera made by the firm of Anderson of Chicago, the feature of which is the ability to swing the screen inwards to the side of the camera for high-light or line work.

The Platemakers' Criterion for June deals also with price, and with the liquid blast blackleading machine, and has a good deal of epigrammatic gossip connected with the craft in America.

The Printers' Register for June 8th has a note on estimating the quantity of ink for three-colour work.

The American Printer for June deals with the relations as they are and as they should be between the engraver and the printer.

School Notes.

AN INTERESTING INTERCHANGE.—The boys at the L.C.C. School of Photo-Engraving, Fleet Lane, London, E.C., visited the Central School of Arts and Crafts on Thursday, June 8th, and were instructed and entertained by a demonstration of typesetting and bookbinding. In return they gave a demonstration of plate-making at the Fleet Lane establishment to the boys from the book production class. They will hardly be able, however, to cry quits, for really their treatment at the Central School was most handsome. Each lad received as a souvenir a "Brief History of Printing" by Mr. Emery Walker, printed and bound by the pupils; a really very excellent piece of work too.

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Ink-knife Intaglio Rotary Machines.

A NEW system of ink knife or scraper for hollow engraved rotary machines has (says *The British and Colonial Printer*) been invented by Mr. E. Mertens, the object being to prevent uneven wear of the knife and the resulting unfavourable effects in printing engravings, as usually met with.

In the new invention the ordinary to-and-fro motion of the knife is avoided as far as possible and a lateral movement given to the instrument extending on each side over about one-half the printing surface of the engraved cylinder or even the total width of the surface of this cylinder and passing beyond it. The strip of metal constituting the knife can, in the absence of space on the sides of the machine, be bent in form of an arc of a circle outside its guiding device and if necessary pass in front of a cleaner and be sharpened. The knife is formed of an endless strip of metal the working part of which is maintained in the required position, *vis-à-vis* the engraved cylinder, by a guide.

The metal band constituting the scraper is wound on to drums to which its extremities are fixed. It alternately winds and unwinds to execute the lateral movement over the cylinder. The knife is worked by aid of a number of levers, the ends of which run in grooves so as to prevent jolting. These levers are moved by means of an endless screw, a helicoidal wheel, an eccentric mechanism, or rods and cranks. Instead of guiding the knife parallel to the axis of the printing cylinder, it can be made to glide spirally over this cylinder, as in the machines for calico printing. Thus the knife is worn away evenly, or nearly so, owing to the lateral movement, by the engraved parts of the printing cylinder. The new invention is applicable to all kinds of hollow engraved printing machines, but is particularly applicable in printing newspapers or illustrated periodicals for which a high rate of speed is requisite.

Recent Developments in Photo-mechanical Work.

KEEPING to the usual classification of processes according to the method of their printing—intaglio, surface, and relief—the most striking advance in the first, is the development of rotary photogravure. Several firms are now producing by this process, and more attempting it, in the same manner as the Rembrandt intaglio company. This firm is now making rotary photogravures in colour, as is also the Van Dyck Company in New York. Mr. Saalburg of the latter company has just been granted an English patent (No. 11527 of 1910) for improvements in colour photogravure. A further advance is the application of intaglio printing to the production of ordinary newspaper illustrations. These are, up to the present, simply inverted half-tones, the etching being made on a copper cylinder instead of the usual flat plate. Then the web of paper passes through the photogravure printing machine and the illustrations are printed; afterwards the paper is passed through the usual newspaper rotary press to receive impression from the stereotypes of the text. Plant for doing these photogravure illustrations is now installed in at least three German newspapers, but, so far, only supplements have contained the photogravures, and the process has not been used to picture current news.

In surface printing the most recent developments are the application of the bromoil process to photolithography and the printing of colour half-tones by the offset method. This latter is being done by one or two firms in America and very successfully here in England by Messrs. Hudson & Kearns.

With regard to bromoil, transfers by this method are particularly useful for large work such as posters. The way the process is worked is as follows. A screen negative is made of the subject and then this is enlarged on to bromide paper. (Naturally, the print may be made by contact if the negative is of the same size as the lithographs required, but in this case it would be simpler to print direct on to the stone or metal printing surface.) The exposed paper is developed and fixed as usual; it is then put into a bleaching solution which has the effect of hardening the gelatine where the image was, without affecting the gelatine that had no image on it. The print is again well rinsed and the surplus moisture blotted off, and then rolled up with photolitho transfer ink, and developed almost immediately with a wet sponge, or piece of cotton-wool. Of

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course the transfer ink may be put on by means of a brush or in other ways. The transfer is then laid down on stone, zinc, or aluminium and printed as usual. It is probable that the same process has been, or can be, applied to the production of prints direct on metal, if the gelatine emulsion were coated on zinc or aluminium instead of paper, after a suitable substratum had been applied.

In relief work there has been advance made recently in the production of newspaper illustrations in Germany, although the means adopted are not new. The method consists in having a special cylinder on the rotary machine devoted to the illustrations only, so that a special ink may be used and the impression cylinder made ready appropriately to the work in hand. Either electros or the original blocks are used, and much finer screens are employed than is usual in newspaper work.

Another development is the production of very large blocks for relief printing. Blocks up to 60 x 40 are now being made and printed. Examples of these developments have been collected by the School of Photo-Engraving and Lithography, and a selection from them has been shown by the School this year at the annual Exhibition of the Royal Photographic Society at the Prince's Skating Club, Knightsbridge.—Mr. A. J. Newton, in *The Lithographic Artists' and Process Workers' Quarterly.*

Brevities.

AUTOMOBILES AND OFFSET.—A very fine specimen of an offset print of an automobile comes to us from the United States. The impression on the rubber sheet was from a Hatt & Knudsen half-tone. The print was on a Patter offset. The specimen sheet comes bearing the legend, "Courtesy of the Licensed Automobile Association of America." We call attention to it to impress how eminently suited offset seems to the reproduction of the motor car.

"T. P.'s WEEKLY" is very complimentary to the *Graphic* in regard to its Coronation achievements. It writes of the first of the four special shilling numbers:—"This week's *Graphic* is the first of a series of four double Coronation numbers at a shilling each. Its special aim is to show how His Majesty King George has been trained for Kingship. He has, for example, seen more of his mighty Empire than any previous monarch. The *Graphic* gives a comprehensive idea, both in its pictures and letterpress, of His Majesty's travels through the Empire. His excellent training in the Navy is also dealt with fully. The number, indeed, is one of the best records of King George's life from childhood down to the present day. The other three numbers will together form a complete record of the Coronation in all its aspects."

THE LABOURS OF THE LECTURE ROOM.—It was a good sign, and must have been very encouraging to Mr. Newton, to see that so many students and older workers in the craft turned up to hear Dr. Kenneth Mees' lecture on "Development." He has been engaged for nine months or more in experimental and research work connected with this subject, and particularly connected with "Fog." Dr. Mees had constructed most elaborate apparatus to make his explanations more comprehensible. One embodied golf balls and pyramids and cubes and wires, and all mounted upon a board some five feet by one. Another contrivance embodied various large tubes on one side of a board communicating with smaller tubes on the other side; the object being to illustrate varying speeds of a liquid ascent in the tubes, determined by the incidence of the apparatus upon the back, but concealed. Different speeds in plate development were under notice at the moment. This mention is only to emphasise the pains taken by Dr. Mees to make his talk as likely as possible to linger in the memory. He was very keenly followed, and as to the questioning he had almost to protest that one inquirer would have made a fine K.C.

RESTORING ENGRAVINGS is treated by the *Pharmaceutical Journal* in its replies to querists; and here are some counsels by our contemporary:—"Wash the sheet on both sides by means of a soft sponge or brush with water containing four per cent. of ammonium carbonate, and rinse the paper each time with clean water. Next moisten with water with which a little vinegar has been mixed; rinse the sheet again with water containing a little chlorinated lime, and dry in the air, preferably in the sun. Another plan used for the restoration of old prints that have turned yellow is to wash them carefully in water containing a little sodium hyposulphate, and then dip them for a minute in diluted solution of chlorinated soda (say, 1 in 40), finally washing thoroughly in running

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water. Solution of hydrogen dioxide may also be used, applied by pouring on the print placed in a shallow vessel. The whole is then exposed to a strong light for some time. If after treatment by any of the above described methods the prints have become too white, they should be immersed in a bath containing a weak solution of isinglass or glue coloured suitably with coffee grounds or other yellow colouring matter. Finally, the damp sheet should be stretched on a drawing-board and allowed to dry spontaneously in a moderately warm, dry room."

BOOK-PUBLISHING BY PHOTO-ENGRAVING.—We have before us a useful little pocket manual $3\frac{1}{4} \times 4\frac{7}{8}$ inches. It is called a *Directory of Paper Makers*, pocket edition, 1911. Its price is 2s. 6d., or in calf case 4s. 6d. It is produced by Messrs. Marchant, Singer & Co., 47 St. Mary Axe, E.C., publishers of the *Paper Makers' Monthly Journal*, the official organ, as they state, and the oldest representative of the paper-making industry of the United Kingdom. This firm issues a stoutly bound *Directory of Paper Makers*, size $7\frac{1}{2} \times 10\frac{3}{4}$ inches. The little "pocket" Directory is almost entirely, though we notice that it is not quite in every page, a reproduction of the larger-sized Directory, by means of photo-engraving. The lettering is quite clear and good. In pages which carry six columns (pages headed "Trade Designations used by Paper Makers, Wholesale Stationers, etc."), the type has the appearance of being a particularly small diamond, but it is legible to ordinary sight. Certainly it is no worry to one who, like ourselves, takes care to have a large magnifier always about him. As a specimen of engraving and fine etching it is remarkable, and suggests that other engraved pocket volumes might well issue. The Directory gives much serviceable information, and perhaps the page 117, headed "Paper Trade Customs," would be as useful as any to our readers. "Sizes of Paper" again are presented under the headings "writings and drawings," "printings," "browns and wrappings," and "cartridges and grocery."

A CLUB FOR ADVERTISING MEN.—A splendid send-off to the new Aldwych Club—inaugurated a short time ago "for the use of advertising men"—was given at the Connaught Rooms on June 29th. Lord Northcliffe (one of the three trustees—his colleagues being the Hon. Harry Lawson, M.P., and Sir George Riddell)—presided over a large gathering of members and their friends at a dinner given to mark the occasion. Supporting the chairman were the heads of many of the leading commercial and business firms in the metropolis, the company including—Sir Thomas Dewar, Mr. A. W. Gammage, Mr. S. F. Edge, Mr. Upcott Gill, Mr. S. H. Benson, Mr. Wareham Smith, Mr. J. McDowall, Mr. G. Kutnow, Dr. H. Kutnow, Mr. G. J. Orange, Mr. Norman Kirby, Mr. F. G. Hartopp, Mr. A. Manders, Mr. H. S. Train, Mr. Hamilton Edwards, Mr. E. Greenwood, Mr. C. Mortimer, Mr. H. Rashleigh Phipps, Mr. Carl Hentschel, Mr. H. Owen, with the hon. secretary (Mr. W. E. Barney). Letters of regret at inability to be present were read from Sir Thomas Lipton, Mr. Barrett (Pears), Mr. C. Arthur Pearson, and others.

Proposing "Prosperity to the Aldwych Club," the chairman said they were gathered together on the occasion of the establishment of the first large club in the City of London devoted to the new science of advertising. To-day advertising had attracted as a profession vast numbers of clever, energetic, and intelligent men, who a few years ago would have found very little scope for their energies in the newspapers. The advertising department of a newspaper was at least as important to-day as any other, and it would be quite impossible to give the magnificent newspapers we had at the present time but for the tremendous growth of advertising. It was a new science, of which they knew very little. While the experts had been cultivating advertising, the public also had learnt something about it; they had learnt that firms advertising as a rule had the best articles. The supply of those able to assist in advertising was immensely short of the demand. The business was a most exacting one—it required not only ordinary business qualifications, concentration of purpose and constant industry, but also very much ingenuity and great capacity of impressing the value of their "proposition." Their new club would enable members of the advertising world to maintain the status of their profession.

Sir Thomas Dewar, supporting the toast in humorous speech, said "advertising had become a science, and those engaged in it were to be congratulated on having a club where they could go to compare notes: they could have competitions to find out what was the circulation of their papers. Advertising had no doubt become a great art—the Coronation was an advertisement to show our loyalty to the State."

Mr. S. F. Edge also spoke to the toast, which was drunk with great enthusiasm. Responses having been delivered by Sir George Riddell and Mr. Wareham Smith, the guests proceeded to the club, which is situated in Aldwych. Its appointments were much admired.

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Estab. Jan. 1894.
"The Process Photogram."

THE PROCESS ENGRAVER'S MONTHLY

Vol. XVIII. No. 212.
AUGUST 1911.

AND ELECTROTYPER'S AND STEREOTYPER'S REVIEW

A Note on the Huebner-Bleistein Process.

Our readers may very probably be aware that the Huebner-Bleistein patents are of a few years' standing. But we may easily be mistaken if we infer that a thing which does not instantly do all it sets out to do is going to fail of its purpose altogether. It is an old story how Mr. F. E. Ives essayed to make three-colour half-tones in America in 1881, and in that year did accomplish very considerable success, but yet did not then and there so impress the craft with the new potency as to prevent a very great delay. Twelve years went by before any other really very important stage was passed in tri-chromatry. The interval between the Huebner invention being patented and its coming into some sort of commercial kingdom is very short in comparison. It certainly behoves the craft to become fully *au courant* with the claims and with what achievements have been attained. The *British Printer* has published in its April-May issue a page portrait of King George produced by this means, and in its letterpress it affords its readers some little insight into the *modus* employed. The able writer of the notes headed "Printing and Process" in the *Stationery Trades Journal* has also dealt with the theme to some slight extent. We have thought it advisable at this juncture to give copious citations from one of the patents. These will be found further on in this journal. Here we may indicate briefly the character of the inventions.

The aim has been to simplify, to cheapen, and to quicken the processes of half-tone printing, and to put more actuality into all methods so far attempted of effective combination of photo-mechanical and lithographic printing. It is in connection with transferring and retransferring that the chief difficulties have arisen, when very long runs of half-tone work have been in question. And it is here Mr. Huebner enters. We take him to be the inventor, Mr. Bleistein being a manufacturer associated with him. Between them, anyhow, they essay the problem of repeating on one plate or a series of plates any number of duplicate impressions in perfect register in exactly right places in reference to each other, thus making multi-colour work safe in execution. There are two machines. In one, plates are rotated while they are coated evenly with collodion, and the collodion is evenly dried. The machine described in the patent from which we give extracts relates to a machine in which a frame or stone stands vertically and a negative is moved up and down or across it. A negative or a series of negatives can be taken of the size of

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one original. The negative or negatives are placed in a box or camera mounted in a traversing frame, and operated by screws or other adjustments, with movements nicely calculated and told off by a horizontal and a vertical scale, having indicators. The carrier containing the negatives travels in a plane precisely parallel to that of the plate carrier, and the negative can be automatically placed over any part of the plate or stone. Behind the negative is a light box; and a vacuum pressure apparatus is part of the mechanism for securing due impingement at the due time. The light chamber moves parallel with the plane of the negative for the purpose of illuminating different portions of the negative successively (reminiscent of our old friends or enemies, the in-and-out, light-and-dark sectioned street advertising signs). When the true contact is made the light operates, and as the plate is sensitised an image is printed and there can then be another impingement and another lighting up elsewhere as desired. Another achievement is that an enlarging lantern can be used so that an image of any desired size may be projected on to the printing surface. Sharpness of image, so eminently desirable (particularly in the cases of designs to be laid down), is promoted by the impression being thus direct on to the metal without intervening transfer.

Of the probable saving in cost we prefer not to write at this stage. The great thing is to see whether the work can be done well by this mode. It is perfectly true that a method may be the cheapest and may also be the best. In certain respects photography will be admitted to be one long and varied illustration of that fact, when one thinks how impossible it would be to gain by lithography, whatever price one might be able and willing to pay, some results which are easily obtained by the process engraver. The question is not so simple when you are comparing, not photography, with something wholly different, but one mode of photographic working with another mode of photographic working. We prefer to refrain from any speculation as to saving, and simply to say that a new incoming process, to have a future, must either effect a very great saving in securing a result already obtainable, or must accomplish a much better result, for the same cost. There has, we think, been too much disposition to acclaim as great discoveries and glorious new powers different means hitherto unsuspected of accomplishing something which, when accomplished, the world has had no particular use for. Frankly, we are not greatly impressed by the royal portrait by this method exhibited in the *British Printer*. However, we keep an open mind upon the matter, and assure the gifted inventor of a fair field in the British Isles and Dominions for this or any other child of his fertile brain.

MANY happy returns to Mr. Punch! He reached his 70th birthday last month, having made his first appearance on July 17, 1841, but the span allotted to mortals is a mere chapter in his superhuman career. He is in the first vigour of youth, as he has always been, and we wish him "Many happy returns," with complete confidence that the wish will be realised. To celebrate the anniversary our laughing philosopher has issued a special birthday number. The price has been doubled, but the value is immensely greater. There is, in fact, nothing in Mr. Punch's successful career which approaches it in fascination. It is a survey of the seven decades, as recorded by that glorious company of artists which included Leech, Doyle, Tenniel, Sambourne, Du Maurier, and Keene, and their worthy successors, whose names may be deciphered with more or less difficulty on the drawings of to-day. The fashions and foibles of the passing years are touched with a humour which comes to us still from "the forties," fresh in 1911.

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Need the Shadows Flee?

Some words of Sir Benjamin Stone have set us thinking. Weighed in connection with his life and career they have compelled continued and deepened thought. The words have relation to the lack of system and the lack of permanence in the photographic work of the day. We need not labour the obvious interest of the photo-engraver that there shall be the utmost shrewdness shown in the selection, the capture, the systematisation, and the preservation of the photographs whose metallic reproduction (on public demand) is to be so large a part of the engraver's business. Sir Benjamin enters a lament in regard to both the needlessly perishable nature of some physical agents used, and equally in regard to the failure to make the best of what we may have secured, by whatever modes, upon our plates. Photography is a shadow science, no doubt, but he feels that there is about it very much more shadow than science. In an interview which *Great Thoughts* has published with this veteran amateur, *apropos* of his work as the only photographer allowed within the precincts of the Abbey at the scene of the Coronation, we find him saying:

"And one has to take care that the quality of the pictures shall be of their best, to ensure their permanence. Of the vast number of photographs which are daily brought into existence extremely few will be of any value after a time. All silver prints are fleeting, whilst bad workmanship and indifferent chemicals bring with them sure and early decay. Well-finished bromide prints have a longer life, and carbon and platinotype may be called permanent. The latter is the best, and lasts as long as the paper on which it is printed. If care is taken to select paper from the best raw materials, free from bleach and other chemicals, it should last as long as any paper documents which are still in existence."

The other word from the Grand Old Man of photography is that to which we especially wish attention to be directed. "Millions of photographs," Sir Benjamin remarked, "will be taken of the present Coronation, but few of them will survive. Even of the last Coronation, which took place only nine years ago, they cannot find any other pictures than mine. The fact is that the present fashion of photography is, in a sense, a wasteful one, owing to the indifference of amateurs to the objects photography should subserve. People who photograph scenes of events should, besides developing and printing them, name them *and date them*. If they did all this, their work would come to form part of our national history, and would stand for reference, whoever took the photograph. As it is, people multiply photographs without any system. Even the photographic societies are not doing their work very systematically. The only records kept are those of the National Photographic Record Association, which has lodged its work with a certain number of the county societies. If this were done on a larger scale the result would be valuable. I started this record-keeping in Warwickshire, and whenever I speak in London I advocate the necessity of their keeping their local records going."

For a moment pause to consider what manner of man is this who gives his counsel. Has he established by personal accomplishments a title to a hearing? Most certainly he has. A Puck at our

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elbow tempts us to trifle and say that he began very wisely by making a fortune in some other field before becoming a camera devotee. Old Caxton did that in relation to print: he was a prosperous wool stapler before he went to the Continent to become acquainted with the rumoured new art of multiplied letters. We have heard it put, more ruefully, that Caxton only became a printer because his wits had first gone wool-gathering. There would have been something to be said by Sir William Gilbert, yesterday, or by Gilbert Chesterton to-day, for compelling everyone projecting work in any photographic or engraving connection to demonstrate that he was *compos mentis* by first accomplishing a success in some other field of art or industry. But, short of topsy-turveydom and fantasy, we do seriously notice that Sir Benjamin Stone speaks not only with the authority of his seventy-four years, but also with the credit attaching to proven capacity in affairs. He speaks, too, as one who has had much to do with such advance as photography has made towards its own coronation—towards the taking up of its own rightful place in the great economy of things, and in the ranks of honours. Mr. Isidore Harris, who writes the account of the interview with Sir Benjamin in our contemporary, very fitly says: "The President of the National Photographic Record Association is the most famous amateur photographer living. He is no ordinary person who snapshots at random, but a worker with a definite purpose. His aim has been to leave to posterity a permanent pictorial record of contemporary life. He has employed his camera to preserve for future times accurate knowledge of the history, politics, antiquities, social life, customs and traditions of Great Britain. His forty years of work has resulted in a collection of about thirty thousand pictures, from ten to twelve thousand of which are from negatives taken by himself. For completeness and variety of historical interest nothing like it exists anywhere."

We have to believe in ourselves more. "Lord, gie us all a guid conceit o' oorsels." As photographers and as engravers we have been doing what we must: it is a wholly different thing to be doing all we can. It is a splendid thing for the world that we have the power of light printing. It is, in colloquial parlance, a good job. Why not make the best of the good job just as we commonly make the best of bad jobs? Why not magnify our office? The first condition of doing this is to want to do it. "Although I do my work as carefully as possible," says Sir Benjamin, "I am never satisfied with it."

Despite the mirrors he introduced into the Abbey, and his attention to top lights on that great Coronation day, we do not suppose for a moment that he was satisfied with what results he was able to obtain from his studio in a tomb. We leave the suggestion with that note of his —the avowal that his greatest successes have all been failures relatively to his endeavour.

He has always aimed to give an artistic atmosphere to his pictures (not, of course, meaning "faking" by this; for faking would have spoilt their value as historic records) — but having invariably made this effort, he has always seen the possible receding from him. Nonetheless, indeed perhaps because of this, he has enjoyed the quest. He has not needed to make a livelihood out of his vast accumulation of camera pictures. He has made something better than livelihood. He has made a life. Why do not we all determine that we too will enjoy, not simply a livelihood, but a life?

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Lead Intensification of Half-tone Negatives versus Copper and Silver.

By A. Anning.

It seems somewhat strange in these days of competition in process-engraving as regards both speed and the low prices obtainable, that the intensification of half-tone negatives by the potassium ferricyanide and lead nitrate method is not universally employed, for there is no doubt that the above method is not only much quicker but more economical than copper and silver intensification, whilst the results obtained are equal and in some cases superior to those arrived at by the use of the latter process.

That lead intensification is not generally used is due solely to want of knowledge on the operator's part. He sometimes regards lead intensification simply in the light of a make-shift.

For instance, the copper-and-silver man has, through misjudgment or some other cause, a negative in which the high-light dots are decidedly overjoined and the shadow dot is on the weak side. Now he knows that a negative of this description is useless for copper and silver intensification, so he endeavours to save it by reducing and then intensifying by the lead process, the general result being a very hard and chalky negative, and in consequence he condemns the process.

The negative required for lead intensification differs somewhat from that which is desired for copper and silver intensification. It should be one in which there is slightly more joining in the high-lights and the shadow dot is smaller.

The reducing solution to be used before intensification consists of potassium ferricyanide 1 ounce, water 20 ounces, added to 2 per cent. potassium cyanide solution. Flow the plate with this solution until the shadow dots are sufficiently reduced in size to give the negative the correct amount of colour and the high-lights in proportion. After a little washing bleach the plate with the following solution: Lead nitrate 1 ounce, potassium ferricyanide 1 ounce, acetic acid ½ ounce, water 10 ounces. Wash well and blacken off with sodium sulphide.

The largest and most up-to-date firms have adopted this method of intensification and have entirely dispensed with the slow and costly silver, copper, and iodine method.

"On the Road" and *Ambassadors of Commerce* are two charming little books full of anecdotes of commercial travellers. We have heard of one poor fellow who took it into his head at last to carry a revolver about with him. As his mind was gradually becoming unhinged he persuaded himself that a refusal of an order was a personal grievance to be averted, or if it occurred, to be corrected by the use of a lethal weapon. But just as he was proving this to be a most effective business-getter, the police interfered, or in some way (for we forget details) his plan was spoilt. A certain process traveller whom we knew well was always perfectly *compos mentis*, yet he had to pinch himself one fine day to make sure whether he was in the land of reality or of dreams when a printer on whom he called to solicit orders for plates, after disputing about proper scale rates, scribbled a few sentences and then handed them to the caller with the words "There; I have roughly drafted out a letter which you might write us. If we receive it I think we may be able to write you that we can do some business on the terms embodied in that letter." Simplicity itself!

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Hints for the Technical and Commercial Photographer.

By W. J. Smith.

(*Concluded.*)

Correct negatives for different purposes—Photolitho transfers—Oil varnish as a colour screen!—The negative considered as a seller of goods—Matt-surfaced P.O.P. toned with platinum—Hints for art gallery work—Reflection troubles—The points of prize animals.

THE commercial photographer is often called upon to make negatives for reproduction purposes, and it is well to know what is required.

For collotype a reversed negative of soft quality is wanted, and the shadows must not show as clear glass; the photographer should therefore use a rapid plate, expose well, and develop short or with dilute developer. For photolitho transfer, what is wanted is a direct negative showing the black as transparency and the whites as opacity. Care must be taken not to thicken any of the fine lines by excessive reduction or close them up by over-exposure or over-intensification.

Do not reduce with a strong ferricyanide and hypo reducer, as it is liable to impart a yellow tint to the negative, involving trouble for the printer. Iodine and cyanide are preferable.

For printing direct upon metal a reversed negative has to be supplied. The lithographer will sometimes require negatives of coloured originals and bromide prints. These are used for tracing over the outlines, and are then transferred to the different stones so that the artist may know where to draw in his different colours.

A negative for this purpose must be a direct one (not reversed) and show every detail, and the bromide print should be on the grey side so that it will be easy to trace over the detail and to distinguish this tracing afterwards. The question of the correct colour screen to use comes in this latter work, and the screens must be used intelligently. In the case of water-colour paintings it is sometimes only necessary to use a screen to stop the ultra-violet, and the writer has known two cases where no screen was required when copying an oil painting, on account of it having been thickly varnished with a very yellow oil varnish, this acting as the colour screen.

For photogravure work a reversed positive of soft quality full of detail is required. Catalogue work forms one of the most important items, and the fact must be thoroughly appreciated that a business man wants a photograph that will help sell his goods, and the print must show the original to its full advantage in regard to grouping, lighting, and perspective, the results being printed upon glossy bromide or mauve P.O.P.

Under this heading comes the photography of nearly every commercial article, and then quality and texture must be reproduced. For instance, the difference between a white flannel blouse and a silk one must be clearly shown, if the best paying and highest class of work is to be obtained.

An artist requires a photograph that reproduces all the delicate tones and modelling and artistic worth of his original.

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Unless the photographer appreciates this artistic value he had better not attempt this class of work. The results (unless for reproduction purposes) are best printed upon matt surface P.O.P. toned with platinum or some of the self-toning papers of art surface. Platinum gives very good results.

Art gallery work forms an important item in duties of the technical photographer. He must have ready to hand the knowledge where and whom to apply to for permits. Reflections cause eighty per cent. of the trouble attached to this class of work, and it generally pays to have the glasses removed if possible; otherwise large black screens have to be erected to stop reflections. Of course for this work panchromatic plates (backed) must be used.

Another remunerative branch of the work is the photography of prize animals, but it is useless to think about the work unless the operator has previously understood what makes the animal a prize one, and renders these special points in the photograph. The Reflex camera is useful for the purpose, used in conjunction with a high-speed plate. The latter camera and plate are ideal for this work. Remember that what the newspapers want are fresh and descriptive photos of any event of public interest.

A knowledge of colour photography and of its application to the numerous processes that are on the market is a valuable possession.

This is a short outline of some of the duties of the technical photographer; innumerable other branches will present themselves. The photographer must be always accumulating knowledge and striving to keep his knowledge up to date. Photographic classes are held in most of the principal towns, dealing with the various branches, and two hours a week spent in them may mean pounds in the photographer's pocket during the year, by enabling him to execute work he would otherwise have to refuse. May it be suggested, too, without offence, that culture and a gentlemanly manner will increase a likelihood of working for cultured and gentlemanly clients, who ordinarily pay well for refined and artistic work?

Give your humblest customer as much courtesy and attention as your wealthiest, and having once acquired a good reputation, do all in your power to keep it and, if possible, improve it.

ALLEGED MISAPPROPRIATION OF NEGATIVES.—At Hythe (Hants) Police Court on Saturday, July 15th, Edward Montagu was proceeded against, on remand, for taking and applying to his own use two glass photographic negatives and divers other articles, the property of the Terraform Syndicate Ltd. Mr. J. R. Randolph, barrister, said that the Syndicate, of which Lord Montagu of Beaulieu was the controlling spirit, engaged the defendant, who was an expert in map modelling, as manager. On April 15 there was a fire at the studio; most of the things were supposed to have been burnt. Counsel said that on April 1 the defendant consigned from Beaulieu Road Station what he described as two boxes of models to Southampton West, to be called for. On the 24th they were delivered to a place of business.

Lord Montagu gave evidence that he had no idea that the defendant was working at Southampton on his own account, and he had never authorised the removal of the property of the Syndicate to Southampton. The defendant never said he was sending articles to Southampton. He received letters from the defendant, in which he stated that his friends were prepared to make an offer for the property of the Company, and suggesting a meeting. Subsequently the defendant complained of inquiries being made about his movements, and tendered his resignation as director.

Defendant was remanded on bail.

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Causes of some Difficulties in Colour Reproduction.

By A. J. Bull, L.C.C. School of Photo-Engraving.

The tenth-metre standard—Plates as poor partisans—Want to accommodate all colours—The confounded nimbleness of greens, blues, and violets: its marplot effect in the ink impressions—The search for dyes—How to get blacks from colours—Snatching a contrast good from wet-plate evil—White from colours—Dealing with stains.

MANY cases arise in the photography of coloured objects where local hand-work or retouching has to be resorted to. These occur when the reproduction is in monochrome as well as when it is in colour, and they are due to certain characteristics of common colours produced by selective absorption. In all these cases there is a perfect agreement between theory and practice, the difficulties admitting of a quite simple explanation.

Some Properties of Common Colours.

The set of curves figured here are typical examples of the way in which the various components of white light are reflected by coloured objects. They show the proportion, expressed as a percentage, of each portion of the spectrum reflected by the colour in question. The base lines representing the spectrum are marked in tenth-metres, *i.e.* ten-millionths of a millimetre. One must remember that when light is separated into its components that one obtains a coloured band, the spectrum, in which the colours shade into one another gradually. Definite positions in the spectrum are usually located by the wave-length of the light expressed in tenth-metres. The light of 7000 tenth-metres is deep red, becoming then bright red, orange, and at 5900 it is yellow for a very narrow space; from here to 5000 the colour is predominantly green, and from 5000 to the limit at 4000 it is blue and violet.

The colours of particular objects are due to the circumstance that those particular objects do not reflect all the components of the white light. On inspecting any such curves indicating this suppression, one notices certain peculiarities which exert a marked influence on photographic work. In comparatively few cases is a large proportion of any particular coloured light reflected, if at the same time another kind of light is strongly absorbed. Of course, if the colour is pale or merely a tint, then all components of the white light are being reflected, some rather more than others, this inequality determining the hue. If, on the contrary, the colour is dark, then no component of the white is reflected in much quantity. The curve showing the light reflected by the yellow ink, No. 1, indicates that it reflects a high proportion of red and green light, while there is but little blue and violet light reflected. This condition, the copious reflection of one kind of light and the strong absorption of another by one pigment, is the one which so seldom obtains, and it is the departures from it, where neither the proportions of light reflected nor absorbed are high, that limit photographic work in so many ways.

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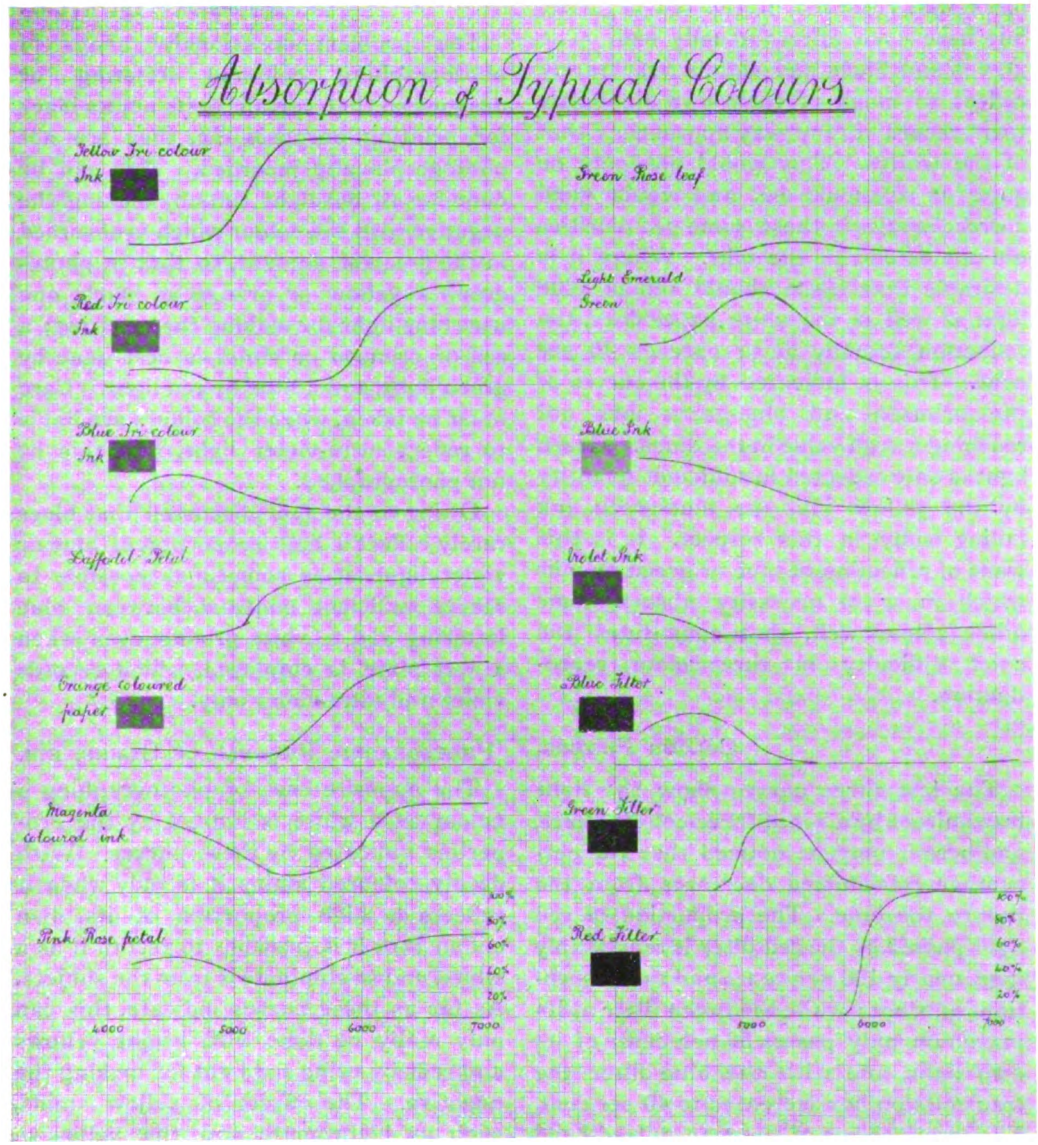

THREE-COLOUR WORK.

It is perhaps in the problem of three-colour reproduction that the effect of these peculiarities is most seriously felt. It determines the manner in which the various colours are recorded and so the proportions of the inks in the reproductions. Since bright yellows reflect both red and green light, and absorb the blue and violet, they are recorded in the red and green negatives almost as well as the whites, while the blue negative treats them as black. Reds and oranges are

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often well recorded in the red negative, but here such effects usually end. The greens and blues and violets very rarely reflect so much of their own light that their record in any way approaches that of the whites. This would no doubt be quite as it should be, and would yield correct results if these same peculiarities did not extend to the inks. Where it is desirable that these should reflect blue light as well as the white paper does, the reflection actually never exceeds 40 per cent. This is indicated by the curves of the crimson and blue-green inks not reaching a high value in the blues. Green light is only reflected in sufficient quantity by the yellow ink, the blue-green ink failing badly in this respect. It is this want of reflection of blue or green by inks which must of necessity absorb some other colour well, that constitutes the chief difficulty in three-colour reproduction.

Colour Filters.

The last three curves show the light transmitted by a set of three-colour filters, and here it may be noticed that the percentage transmitted decreases from the red to the blue. The proportion of red light passed by the red filter is remarkably high, nearly 100 per cent., and the absorption is abrupt; while the green filter at its maximum only passes 56 per cent. of its own light, and with the blue filter the transmission has decreased to 40 per cent. The terminations of the transmitted band have also ceased to be so abrupt. These would appear to be essential properties of the colours so far available; for in the search for dyes no trouble has been spared to secure those with the most abrupt absorptions, which transmit as much of their own light as possible.

Contrast Work.

The problem occasionally arises of photographing coloured lettering or designs, so that certain parts act as black for printing purposes, *i.e.* they are not photographically recorded. This can be done for all but light tints by making the negative with the colour which is absorbed in the greatest amount, so that to photograph a yellow or orange as black, one uses blue light for making the negative; a red or crimson or violet is best done by green light, and a blue by red light. Care must be taken, when the colours are liable to reflect ultra-violet light, that this be not photographed.

Owing to the fact discussed that blues rarely reflect a high proportion of blue or violet light, it is sometimes possible to secure sufficient contrast between blue lettering and a white ground, even when a wet plate is employed, which records violet and ultra-violet only.

Photographic Removal of Stains, etc.

The opposite case of photographing a colour as a white is limited by the properties indicated by these curves. With deeply coloured stains it is only when it reflects a high proportion of its own colour that it is possible to record it as a white, and so eliminate it from the subject. As far as these curves indicate, this can only really be done with bright yellows and reds by using red light for making the negative. The effects of yellow stains, such as bichromate and the yellowish colours of old prints, are best dealt with in this manner. Other cases in which this is possible are, that some magenta colours reflect sufficient violet and ultra-violet to photograph almost as white on a wet plate and the well-known Chinese white and quinine filter case.

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Facings and Pacings.

By "Ion."

I HAVE in times past attended some July foundry trade outings, and it was clear to me that they were a sort of shot solder or tinfoil. They enabled the shining upper layer to unite (for once a year anyhow) with the lead and the other lower-priced metal. I remember as I write that the upper metal in ordinary electros is only copper after all, and that it surely ought to be gold to make my figure apply quite nicely; so I think I shall call it gopper. Nor must the word "lead" as applying to the journeyman give offence.

I fall back on the always available Bard of Avon. The king's printers turned to him when they issued a booklet to introduce their lead-moulding electros. They reminded the craft how when Bassanio had to choose amid the caskets in the *Merchant of Venice* he would have none of the gold casket—"hard food for Midas, I will none of thee." Nor would he bother with silver, "thou pale and common drudge 'twixt man and man." But as for lead—"which rather threatenest than dost promise aught, thy paleness moves me more than eloquence." After which let no journeyman be disgruntled at my comparison.

Which notes, so far, are for enforcement of the pious wish that next year the outings may be resumed.

I wonder if the duplicate trade know that the St. Bride Technical Library in London contains a little book printed from plaster cast plates by Ged in the very earliest days of his electrotyping. About 1723, if my memory serves. It is a small book, and as a piece of print it is no way remarkable; but as the first production in the world that I have been able to hear of, printed from stereo or "solid" types—that's what stereo means—it is worthy all honour.

It has an interest, too, even for those who have no special concern with printing, for it illustrates a thing which happily occurs but very rarely in the world's experience. The Scottish goldsmith was mortified by certain treatment he received, and he kept his stereotyping secret to himself. After his death no one was able to make stereo plates, and for many long years stereotyping was as much a lost art as the making of flexible glass is lost to the world to-day. It was reinvented by one of the Foulis family of Glasgow.

Handsome compliments to British stereotyping have lately been paid, and very authoritatively, in America. The expert of the *Inland Printer*, Chicago, tells his readers that stereotyping is carried to much higher developments in Great Britain than in America.

They duplicate pretty well everything in America, in some form or by some means or other. It leads to mischances sometimes. As happened a few years ago, when it befell, owing to a book being written in serial form, and successive parts of it duplicated, that the heroine had red hair at the start, black hair in the middle, and golden hair at the end. I believe they'd have turned it to silver if they'd only kept her on long enough.

I don't say they were bound to expose the poor girl to all this suspicion of making-up. They could surely have remembered that every self-respecting foundry has an interesting tool for piercing. I have a sneaking fear that if I probed or pierced this story thoroughly enough I might find that this tool was

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not forgotten after all; and as I don't want to spoil the tale as received, I'm certainly not going to inquire any further into it.

Just one practical suggestion for this month—that curved rotary electros are commonly ordered of a thickness quite in excess of what is needful.

Mr. F. E. Ives's Plain Words on the Half-tone Plate: An Optical Substitute for the "V-" Shaped Tool.

No Essential Improvement in Twenty-Five Years.

By courtesy of the *Inland Printer* of America we are supplied with an advance copy of a portion of a report appearing in the August number of that journal. The Photo-Engravers' Convention were in conference at Cincinnati on June 27th and 28th, and the *Inland Printer* has naturally given much attention to a gathering so interesting to large numbers of its readers.

During the meeting a very interesting greeting to the conference from Mr. Arthur Cox, the Birmingham President of the British Process Engravers' Association, was read to the meeting by Mr. Levy.

There was much interest in the promised attendance of that veteran inventor and expert in photo-engraving. Mr. Frederick E. Ives.

On the announcement by the chairman, Mr. C. C. Stiles, that they were now about to hear one they had come thousands of miles to meet, who would tell them of the early history of the half-tone process and the evolution of the half-tone screen:

The Usefulness of Right Theory.

Mr. Frederick E. Ives was received with a hearty ovation. He said: "It has been suggested that some information such as I can give about the conception and evolution of the half-tone process might prove interesting to members of this Association. I am afraid that neither the history nor the science of half-tone has ever held very much interest for the majority of photo-engravers, who have been content to know practically the best methods of arriving at the successful results. I know that when I suggested to the author of a pretentious text-book of photography, himself a photo-engraver, that it was useful to know that the successful employment of the half-tone process screen was based upon a recognition of the fact that when correctly used it afforded an optical substitute for the V-shaped tool of the hand-engraver, he assured me that such theoretical considerations were of too little practical interest to justify giving up space to them.

Born Perfect.

"Nevertheless, the cross-line half-tone screen process owes its origin and perfection to exactly such theoretical considerations, and was full born and perfected as a mental conception before the first sealed cross-line screen was produced.

"Not only so, but I unhesitatingly say that there has been no essential improvement in the process itself in nearly twenty-five years."

Mr. Ives here told the story of his early trials with printers who would insist on

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using plate paper and soft tympan in proving his first plates, and continued:—

A Wild-Seeming Prophecy.

"The half-tone plate as we know it to-day, with black cross-lines in the shadows, and white cross-lines in the lighter shades, and the surface of the lines and dots flat and on one plane, and the three-colour half-tone process, were really invented by me while I was in charge of the photographic section of Cornell University in 1878. In a talk to some of the students at that time I confidently predicted that within ten years photomechanical engraving would generally replace wood engraving, and that three-colour process printing would replace chromolithography in books and magazines.

Vis Inertia.

"I already saw how it might be all accomplished, but made the mistake of underestimating the conservatism of established methods. It will seem less surprising that a mere youth foresaw all this when I tell you that I was probably the only person in the world who was at the same time an expert practical printer, an expert photographic operator, an amateur wood-engraver, and a competent inventor. So that my special knowledge and experience converged with my natural inclination to just such a focus that I attacked the problem with a perfectly clear understanding of the requirements, and half-tone was with me just as definite and scientific an invention as the phonograph was with Edison or the telephone with Graham Bell.

The Translation of Body Shades.

"It did not, as many have supposed, grow out of the obvious fact that the line-screen in contact with a photograph must cut the photographic image up into lines, but out of recognition of the fact that for this purpose body-shades must be translated into shading by graduated lines, as in wood-engraving, and this was brought about first by the actual use of a V-shaped tool in its relation to a graduated photographic relief plate, and then by logical process of evolution to practical simplicity, by the substitution of an optically produced V line.

"Meanwhile, approximations to the required results were arrived at by others by experiments carried on without a distinct recognition of the true principle involved.

"So far as I know, no method or detail of method which remains in practice to-day was evolved by others in advance of my own consistent development from my original conception of the true principle involved in translating body-shades into graduated lines. My great mistake, as it turned out, was that I did not save others the trouble of going over the same ground by prompt publication of my own methods and progress. I know now that I could not have lost anything by doing it."

Apologetically Mr. Ives then related the history of his youth and how he came up to the half-tone process.

A Farmer's Boy.

"I was born on a small farm four miles from Litchfield, Conn. Not only my father, but all my relatives were farmers. I was drilled into farm-work as early as possible, and even kept out of school in summer to help on the farm. I was scolded a good deal because I would not do as much heavy work as some of the neighbours' boys. And when my father once caught me drawing a picture he snatched away the pencil and sent me out to distribute fertiliser, telling me at the

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same time never to waste my time in that way again.

"When I was nine years old my father became a country storekeeper, but he died two years later of consumption. I clerked for a while in a country store, but was discharged, partly because I was not strong enough, though chiefly on account of my habit of stealing into the back room to work out inventions. After a term in school I bought a very small printing press on which I printed envelopes, etc., for the storekeepers. This led to an apprenticeship in the *Litchfield Enquirer* printing office when I was thirteen.

HIS AMATEUR PAPER.

"There I was doing most of the job printing in a little while, and also on my own time, nights and Sundays, printed and published an amateur paper. I did a mail-order business in printing visiting cards, taught myself photography by the old wet-plate method, and tried to teach myself wood-engraving.

"I worked as a journeyman printer at Ithaca, N.Y., for a year after finishing my apprenticeship, took up view and portrait photography, and at nineteen took charge of the photographic laboratory at Cornell University. There I worked out a most successful method of swelled gelatine-relief photo-engraving, by which I made, before I gave it up, thousands of printing plates.

"THE MORNING HAS GOLD IN ITS MOUTH."

"I could only reproduce definite line and stipple, and tried to think of a way to translate the body-shades of photographs into line and stipple so that I might reproduce them. I finally decided that it might be accomplished by utilising in some way the relation of a V-shaped engraver's tool to a graduated photographic relief, like the Woodburytype gelatine relief. Just how to go about it was not clear to me, when after several hours' thought about it I went to bed one night tired out. Awakening in the morning I saw instantly, apparently materialised in the air before my eyes, the whole mechanism of the process. I got up, dressed, wrote out a specification and had it signed by witnesses, and in two or three days had specimens to show.

THE SWELLED GELATINE.

"Soon after I got a position to work my line photo-engraving process, first in Baltimore and later with Crosscup & West, wood-engravers in Philadelphia. This firm did not have money enough to buy a photographic outfit, so I purchased one and a small printing press on my own credit. They paid me $15 a week for one year. With no help I made negatives, swelled gelatine-reliefs, wax casts, stereotype moulds, finished the plates, and made the proofs on the printing press. Crosscup & West cleared a little over $100 on my work that year.

"The second year I had the same wages, but with the addition of a $3 a week helper I did better. I also modified and reduced to practice my half-tone process, and commenced to turn out a few plates commercially in February 1881.

"It was a beautiful but complicated process, scientifically perfect but not very commercial, even if it had been adequately appreciated. I made various improvements from time to time, but was limited to the use of the swelled gelatine relief process, as there were no successful etchers in this country at that time. Later, some of the best work was done with the photo-electrotype process, but the negatives had to be sent to New York for that purpose.

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"I soon realised the theoretical possibility of using a screen for negative-making in such a manner as to obtain an optical substitute for my mechanical V line, and so get the results much more directly and cheaply, and I prepared a patent specification which was the first statement of the optical V-line principle; but the necessity for absolutely sharply defined lines and dots in the negatives used to make swelled-gelatine relief plates, and the fact that a man who has to support a family on $18 a week finds even the taking out of patents a serious tax, prevented me from putting the application in the Patent Office.

FUZZY MEISENBACHS.

"This was all before the Meisenbach screen process had been heard of. Meisenbach made negatives so 'fuzzy' that they would have been perfectly useless for the swelled-gelatine photo-engraving process, but he saved the situation by making etched relief plates, and defects in gradation which were inherent in his method of using a screen were compensated for as much as proved practicable by elaborate processes of burnishing, rouletting, etc. Even with all his 'faking' he did not get nearly as accurate reproductions as I was getting by pure process, but his process was cheaper and better adapted for handling large sizes.

"I knew I could beat Meisenbach to death with my own ideal screen process if I could have an etching process to make the plates. When we got an etcher he commenced with zinc, but with my help developed the first enamel copper process, while I perfected the screen process in accordance with my original conception of an optical V line, which worked out in cross-line to be more conveniently described as the pinhole image process.

MY FIRST SEALED CROSS-LINE SCREEN.

"My first sealed cross-line screen, practically identical with those used to-day, was made in the winter of 1885–6, and though I first used it in a copying camera with glass positives, and used it only on a selected portion of my work, it was not many months before I had it in operation exactly as it is used to-day.

"I did not patent, as I might have done, the principle of the formation of the optical V cross-line, the shaded pinhole image of lens diaphragm, special shaped and multiple stops, intensifying and clearing to sharpen the lines, etc., as successfully worked out in my screen process, because Crosscup & West were afraid to have it published, urging me that it was safer to keep it a secret. It proved that they were quite mistaken about this, and I suffered irreparably by following their advice. We did, however, teach it as a secret process, and for a small nominal sum, to parties in New York, Boston, and Buffalo, who could testify, if they cared to do so, as to the originality of the process and the full exposition by me at that time of the principle now generally recognised.

THE WORK OF OTHERS.

"I do not wish to minimise the good work done by others. Some of the work which I did was done independently by others, who were not informed of my methods, owing to the unfortunate attempt to hold them as secrets. But the significant fact is that because I started out with a perfect knowledge of the requirements, and recognised the fundamental principle involved, I not only made the first half-tone plates meeting the technical requirements, but by consistent process evolution arived twenty-five years ago at a process so practical

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and efficient that nobody has been able to make any material improvement on it to this day.

FIFTY INVENTIONS.

"I have patented fifty inventions. Many of them, like the three-colour half-tone process, were made many years before the conditions were right for successfully exploiting them. When I made the first specimen of three-colour half-tone printing in 1881, nobody was apparently in the least impressed with the possibilities of such a method. My specimen hung framed on Crosscup & West's office wall for years. I first succeeded in getting it mentioned in a technical journal in 1884, exhibited it at the Novelties Exhibition, Philadelphia, in 1885, and the process was patented as a new invention by three different men in different countries ten or twelve years after my first specimen was made."

TRIPAK PHOTOGRAPHY.

Mr. Ives concluded with a description of his latest invention, Tripak photography, by which three-colour record negatives are made with one lens and a single exposure with a compact camera.

He received a rising vote of thanks from the Convention, and then, as a complete surprise to him, Mr. Gustav Zeese, of Zeese-Wilkinson, New York, presented Mr. Ives with a costly watch and chain as a reminder, he said that the photo-engravers did not forget the debt they still owed to Mr. Ives.

MR. HORGAN'S REMINISCENCES.

Mr. S. H. Horgan, editor of "Process Engraving" notes in the *Inland Printer*, arose to add his mite of praise for the great things Mr. Ives had done for process engraving. He said that this Convention would pass into history as the one that had brought Mr. Ives before them to tell what he had accomplished. After praising the great achievements of Mr. Ives he related how he called on Mr. Ives at Crosscup & West's place February 5th, 1882, and they compared proofs of half-tones they had made, when Mr. Ives said that it was seeing the half-tones Mr. Horgan was making in the *New York Daily Graphic* in the late seventies that first attracted Mr. Ives' attention to half-tone.

In 1892, while Mr. Horgan was art manager of the *New York Herald*, Mr. Max Levy asked him where he got the half-tone screens he was using fifteen years before that time, which screens were made in all sizes by the Leggo Bros. in Montreal prior to 1873.

Mr. Horgan then told of the work of Gen. Frederick W. Von Egloffstein, who had Sartaln of Philadelphia rule half-tone screens for him in 1861, and who in 1868 had a large establishment in New York engaged in engraving half-tone intaglio, all of which dates should go into the record they were then making of the early history of half-tone.

UNITY of plan in illustrated journals is not always so apparent as it conspicuously was in the case of the four-shilling special *Graphics* produced during the Coronation period. In that case the editor had fastened very fittingly on the imperial aspect of the King's training. He reflected that King George had personally seen more of the empire than any British monarch, and he illustrated variously the connection of the King and his dominions. Similarly the editor of the *Sphere* adopted a central idea; namely, that previous Coronations along the line of the centuries had been marked by human incidents and episodes worth recalling. The relevant point is that this involved much research for the obtaining of suitable pictures. The labour was undertaken and admirably carried through.

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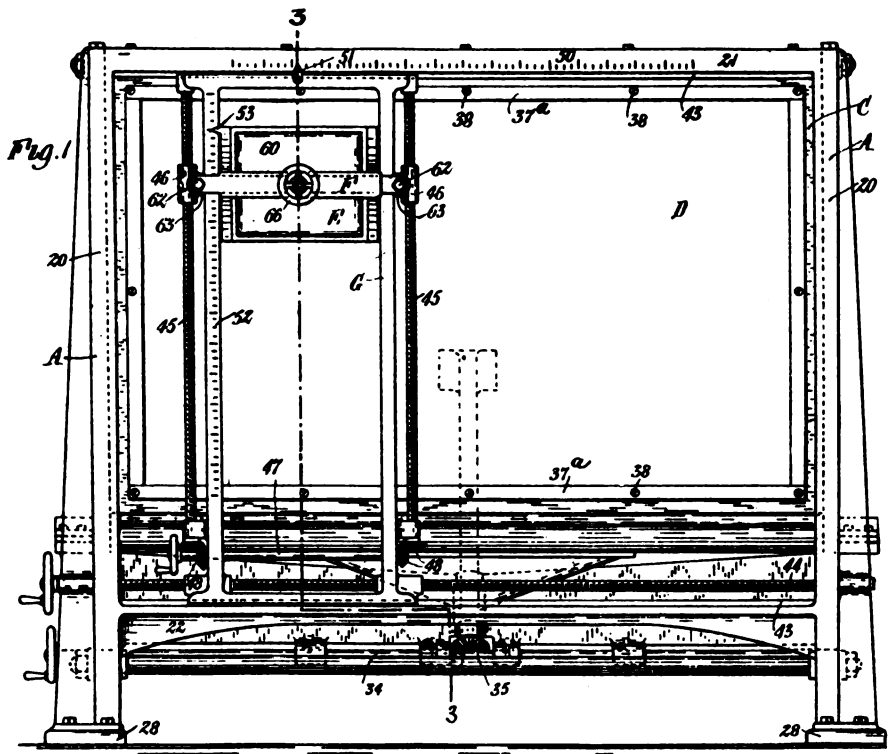
A Huebner-Bleistein Patent: Is it a New Lease of Life for Litho?

OUR readers will be interested in details of the mechanical contrivances whereby it is proposed that multiple photographic images shall be automatically obtained in a machine from the same negative; and if desired shall be obtained upon such medium as shall be easily practicable for lithographic or for offset printing.

Bleistein, manufacturer, of 197 Main Street, both of Buffalo, in the State of New York, United States of America.

From the body of the specification we learn that this invention relates to an apparatus for producing photographic prints upon the sensitised surfaces of metallic or other plates or lithographic stones which are afterwards finished



The stationary frame.

The matter is not new, but as preliminary difficulties have now been much more effectively dealt with, in America at any rate, than a short time ago seemed likely, it is worth while to study the matter very thoroughly. We allude to it in our article elsewhere in this journal.

A patent (No. 23,701) was applied for 5th November 1908 and acceptance granted 15th April 1909. The details set forth that it is a communication from William Carl Huebner, lithographer, of 32 Laurel Street, and George

in any suitable manner for printing in one or more colours.

LIGHT CHAMBER MOVABLE.

The apparatus comprises a stationary frame, a holder for the sensitised plate or stone which is movable in the stationary frame toward and from the position for exposure or printing, and a hood or light chamber which contains illuminating apparatus and is provided with a transparent negative or positive printing plate, and which is so mounted in the stationary frame

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that it can be adjusted to stand opposite any portion of the sensitised surface upon which a print is to be made, and can be adjusted toward the sensitised surface to press the printing plate against the same; so that a plurality of printing surfaces can be formed in predetermined locations upon the same plate or stone.

OR LIGHT CHAMBER FIXED.

It has been proposed to combine with a stationary negative a light chamber which is

Fig. 1 is a front elevation of this improved printing apparatus.

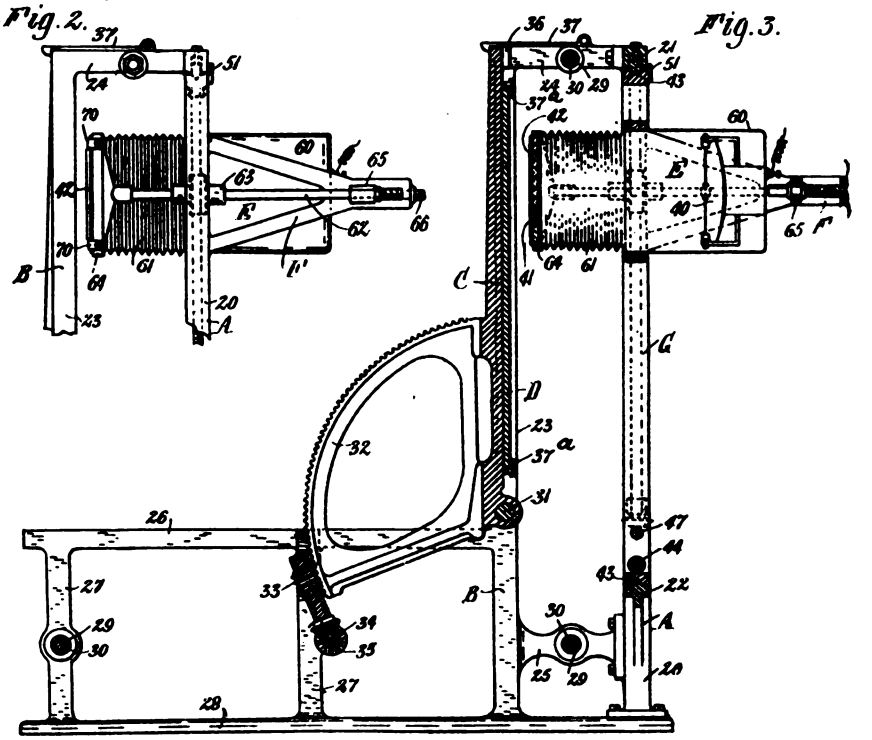
Fig. 2 is a fragmentary end elevation thereof.

Fig. 3 is a vertical section in line 3—3, fig. 1.

Fig. 4 is a fragmentary front view of one corner of the sensitised plate and its fastening devices.

Fig. 5 is a horizontal section in line 5—5, fig. 4.

Fig. 6 is a sectional elevation, in the same plane as fig. 3, on an enlarged scale, of the upper portion of the frame and adjacent parts.



Vertical line section of the stationary frame.

movable parallel with the plane of the negative for the purpose of illuminating different portions of the negative successively, and to mount the sensitised body in a holder which is pivoted so that it can be swung toward and from the printing position; it has also been proposed to combine such a pivoted holder for the sensitised body with a stationary light box, and it has been proposed to mount the sensitised paper, the negative, and the pressure plate in a sliding carrier or holder which can be placed opposite the light opening of a stationary light chamber or away from such opening.

Fig. 7 is a top plan view of the same parts.

Fig. 8 is a face view of the inner end of the printing hood, on an enlarged scale.

Fig. 9 is a horizontal section in line 9—9, fig. 8, on an enlarged scale.

Fig. 10 is a vertical section in line 10—10, fig. 8, on an enlarged scale.

Fig. 11 is a fragmentary sectional elevation showing a modified construction of the holder for the sensitised plate or stone.

Fig. 12 is a horizontal section in line 12—12, fig. 11.

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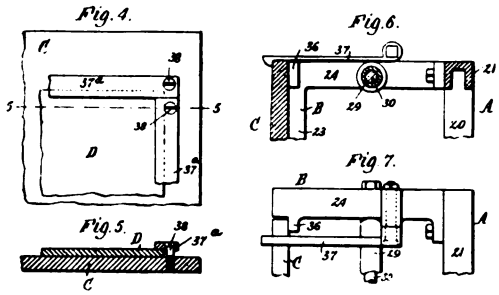
Fig. 13 is a fragmentary inside elevation of this holder with the pressure plate removed.

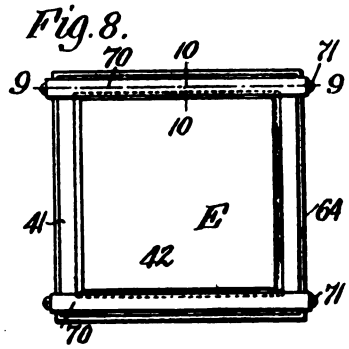
Like reference characters refer to like parts in the several figures.

THE PLATE-HOLDER.

C represents the holder for the sensitised plate or stone D movably mounted in the stationary frame so that it can be placed in the proper



position for receiving the sensitised plate or stone, or in the proper position for exposing it. As shown, this holder is attached at its lower end to the stationary frame by a horizontal transverse pivot or arbor 31 and is swung on the same by means of a gear segment 32, secured to the rear side of the holder, and a worm 33 meshing therewith and journalled in the stationary frame. This worm is conveniently operated by a horizontal shaft 34, provided at one end with a hand



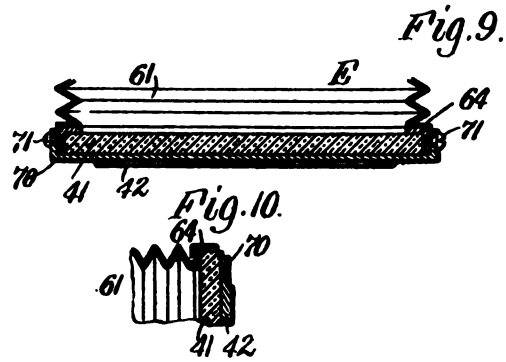
crank and geared with a shaft of the worm by wheels 35. The holder is placed in a horizontal position for applying or removing the sensitised plate or stone, and in an upright position for exposing the sensitised surface. When the holder has reached the upright position it bears against stops 36 on the top pieces 24 of the side frames B, and is preferably held by catches 37.

The sensitised plate or stone is secured to the holder by any suitable means; for instance, as shown by strips 37ª fastened to the holder by screws 38 and bearing against the marginal portions of the plate or stone. The holder is provided with various sets of screw-threaded openings for adjusting the holding strips to plates or stones of various sizes.

THE LIGHT CHAMBER.

E represents the printing hood or light chamber, which contains electric illuminating apparatus 40 of any suitable kind, and has at its inner end a transparent face plate 41 to which the transparent printing plate 42 is attached, which may be a negative or a positive.

This hood is attached to a carrier frame F, which is movable up and down in a vertical carriage G, the latter being movable trans-



versely between horizontal guides 43 on the upper and lower bars 21 and 22 of the front frame A.

By adjusting the carrier frame up or down in the carriage, and by adjusting the latter transversely in the stationary frame, the hood can be adjusted to stand opposite any desired portion of the sensitised surface. The carriage is preferably adjusted by means of a transverse screw 44 journalled in the front frame. The carrier frame is preferably adjusted by two upright screws 45 journalled in the carriage and working in nuts 46 on the sides of the carrier frame. The two screws 45 are simultaneously actuated by a horizontal shaft 47 geared with the screws by bevel wheels 48.

Suitable scales or graduations are provided by means of which the carriage and the carrier frame can be accurately adjusted. For instance, as shown, the top bar 21 of the front frame A can be provided with a horizontal scale 50 on which the position of the carriage is indicated by a pointer 51, and the carriage can be provided

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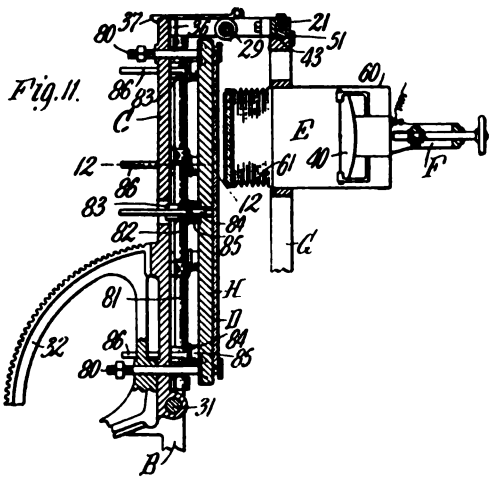
with a vertical scale 52 on which the position of the carrier frame is indicated by a pointer 53.

As shown, the hood comprises an outer rigid portion 60 in which the illuminating apparatus 40 is arranged and an inner extensible portion 61, which carries at its inner end the face plate 41. The rigid portion 60 of the hood is secured to the carrier frame F, while the inner extensible portion 61 is movable toward and from the holder C and the sensitised plate or stone thereon, so that the negative can be pressed closely against the sensitised surface. For that purpose the hood is provided on both sides with longitudinal guide rods 62 which are arranged in sockets 63 on the carrier frame F and secured at their inner ends to the frame 64 at the inner end of the extensible portion 61, and at their outer ends to a cross-head 65 connected to an adjusting screw 66 which works in the outer portion of the carrier frame.

The face plate 41 is seated in the frame 64 at the inner end of the extensible portion of the hood and is secured therein, as represented in figs. 8, 9, and 10, by cross bars 70 and set-screws 71. The cross bars are bevelled on their sides and bear against the adjacent bevelled edges of

Fig. 11.



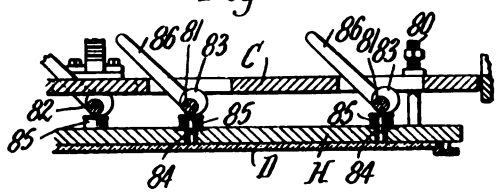
the printing plate 42, thereby securing the latter to the glass plate in such a position that the printing plate projects inwardly beyond these holding bars and can be closely pressed against the sensitised surface.

Plurality of like Surfaces.

If it is desired to provide the sensitised surface with a plurality of like printing surfaces, this is readily done by shifting the hood or light chamber from place to place over said surface.

If it is desired to provide several plates or stones with a similar number of printing surfaces for printing in several colours, the exact position of the hood in each place is noted by reference to the two scales. Then, upon removing the plate or stone which has been exposed and applying the sensitised plate or stone for the next colour to the holder, the hood can be again placed into each of the former positions by reference to the scales, and the prints for the second colour can be made upon the second sensitised surface in exactly the same positions

Fig. 12.



in which they were made upon the first sensitised surface, so that they will accurately register with those previously made on the plate or stone for the first colour.

Each additional plate or stone is treated in the same way, and the resulting set of plates or stones contains on each plate or stone a plurality of printing surfaces for one colour, with the corresponding surfaces on the several plates or stones in exactly the same relative position so that they will register correctly.

Surfaces Differing from each other.

If it is desired to provide the sensitised plate with a plurality of printing surfaces which differ from each other, the operation is carried on in the same way, but different printing plates are applied to the hood or light chamber for producing the different prints, as may be necessary. Although the prints on the same plate or stone are different in this case, the corresponding prints on the several stones or plates are alike and in correct register.

The sensitised plate may be provided with a number of negative prints by using one or more transparent positives on the hood instead of one or more negatives. The negative plate so produced contains a plurality of prints and is used for producing positives and further negatives, each containing a plurality of similar prints and all in correct register.

In the modified construction of the plate-holder represented in figs. 11-13, the pivoted holder C is provided on its inner or face side with a pressure plate H to which the sensitised

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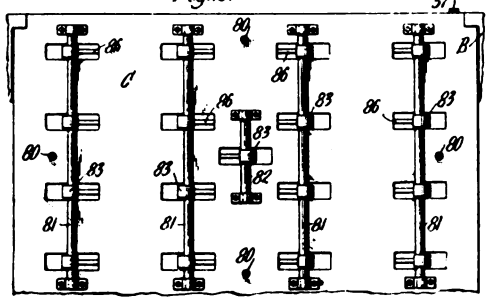
plate D is secured, and which is movable on the holder C toward and from the face plate of the hood. The pressure plate is movably attached to the holder C by horizontal bolts 80 which slide in the holder. The latter is provided on its inner side with shafts 81, 82 carrying cams or eccentrics 83 by which the pressure plate H can be pressed toward the hood. The pressure plate

Fig. 13.



is preferably provided with yielding devices against which the cams or eccentrics bear, and which consist of sliding bolts 84 backed by stiff springs 85. The shafts are provided with levers 86 by which they can be turned. By means of these eccentrics or cams pressure can be applied to different portions of the pressure plate and a most intimate contact of the printing plate with the sensitised surface can be established.

Having now particularly described and ascertained the nature of the said invention and in what manner the same is to be performed, as communicated to me by my foreign correspondents, I declare that what I claim is:—

THE CLAIM.

1. An apparatus for producing photographic prints upon a sensitised surface, comprising a stationary frame, a holder for the sensitised surface which is mounted in said frame and movable therein toward and from the printing position, a light chamber or hood containing illuminating apparatus and carrying a transparent printing plate, means for adjusting the light chamber or hood and the printing plate carried by the same in a plane parallel with the sensitised surface when the latter is in its printing position, and means for adjusting the light chamber or hood and the printing plate thereon toward the sensitised surface and pressing the printing plate against the sensitised surface when the latter is in the printing position.

2. A photographic printing apparatus according to Claim 1, characterised by means for adjusting the light chamber or hood in a plane parallel with the sensitised surface and in two directions at right angles to each other, which means may be a carriage adjustable in guides on the stationary frame and having guides for the light chamber or hood arranged at right angles to the guides in which the carriage is adjustable.

3. A photographic printing apparatus according to Claim 1 characterised by a hood having an outer rigid portion which is carried by a frame adjustable in a plane parallel with the sensitised surface, and an inner extensible portion which is adjustable toward and from the sensitised surface.

4. A photographic printing apparatus constructed and having its parts arranged and adapted to operate substantially as described with reference to the accompanying drawings for the purpose specified. Dated this 5th day of November 1908. Haseltine, Lake & Co., 7 and 8 Southampton Buildings, London, England, and 60 Wall Street, New York City, U.S.A., agents for the applicant.

RESTORING ENGRAVINGS is treated by the *Pharmaceutical Journal* in its replies to querists; and here are some counsels by our contemporary:—

"Wash the sheet on both sides by means of a soft sponge, or brush with water containing four per cent. of ammonium carbonate, and rinse the paper each time with clean water. Next moisten with water with which a little vinegar has been mixed; rinse the sheet again with water containing a little chlorinated lime, and dry in the air, preferably in the sun. Another plan used for the restoration of old prints that have turned yellow is to wash them carefully in water containing a little sodium hyposulphite, and then dip them for a minute in diluted solution of chlorinated soda (say, 1 in 40), finally washing thoroughly in running water. Solution of hydrogen dioxide may also be used, applied by pouring on the print placed in a shallow vessel. The whole is then exposed to a strong light for some time. If after treatment by any of the above described methods the prints have become too white, they should be immersed in a bath containing a weak solution of isinglass or glue coloured suitably with coffee-grounds or other yellow colouring matter. Finally, the damp sheet should be stretched on a drawing-board and allowed to dry spontaneously in a moderately warm, dry room."

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My Causerie.

WE all remember the poster which met Mark Twain's eyes on his first day in Liverpool: "Arrival of Mark Twain. Ascot Cup stolen," and how he protested that he couldn't get near to the Cup, and in any case didn't know its value; and never stole anything without understanding beforehand what value he was getting. Alas and alas, it is not open to us now to wonder if Twain can have been among the Coronation guests at Spithead, as he doubtless would have been had life endured and health permitted. But as Wordsworth invoked Milton —"thou shouldst be living at this hour; England hath need of thee"—some feel that we needed Twain to do full justice to a certain camera incident.

Here is a *Morning Post* advertisement. "HOUSE OF LORDS BOAT, SPITHEAD REVIEW. Will the nobleman or gentleman who REMOVED a ¼-plate Soho CAMERA with Zeiss-Tessar lens, also a Plate Carrier, both in leathern cases, from a middle-dock hatch of the Admiralty s.s. 'Rohilla,' kindly RETURN same to Owner, 16, Hertford-street, Mayfair, London, W.?"

We can't deem camera lifting a "gentlemanly" thing to do, so in the horrible dilemma we dismiss the second alternative submitted by the advertiser. It must have been a nobleman! And now we must look for another advertisement, say like this:

"To process engravers, or newspapers using illustration. Titled press photographer in reduced circumstances offers his services; with all benefits of social entrée, and unsurpassed connections. Constant stream of royal and other portraits. Country house romps artfully snapped. Would cite previous experience, including Coronation Review at Spithead. Uses ¼-plate Soho, with Zeiss-Tessar lens. Address with salary offered (not under 1000 guineas) to 'Veto Victim,' Box, etc."

To be sure, process-engravers are not trading as art publishers as a rule, but we can't expect the nobleman to know that right off.

This possibility of familiar intercourse with a nobleman is naturally quite exciting to those of us whose only thoroughly aristocratic intimacy is our acquaintance with our old friend 'Count Rendered.

I suppose the tendency will more and more be for engraving works to set up branches in country places. With that thought I will suggest that the various forms of air-gas may be worth considering, even where arcs are going to be used. I suppose we cannot expect to reproduce in these northern islands the happy experience of the Australian or New Zealand engraver who can pitch a studio on the top of his building and can rely, day in, day out, on glorious sunlight serving his need (still more, perhaps, can the Indian engraver; barring always the rainy season).

Of the air-gases, to speak of them colloquially, the one I have had some occasion to acquaint myself with is the Simpitrol light, a blend of about 98 per cent. of air with about 2 per cent. of vaporised petrol. I see that a pamphlet, "The Triumph of Simpitrol" (Simpitrol Buildings, 216 Tottenham Court Road, E.C.), tells us that records of actual use as set forth in the book "bring out the striking fact that even if electric current for lighting were sold at ½d. per unit, and metal filament lamps were used, Simpitrol would still be the cheapest and best light to employ."

The very first sentence in the book sets forth an ascertained 7s. per hour as the cost of lighting a works by its agency, with a light totalling 83,000 candle-power, as against 22s. per hour for lighting it with 48,000 candle-power. This was the actual record made at the Alexandra Mill, Preston, and, moreover, this understates the case, says the booklet. For since the obtaining of the records here set forth, independent photometer tests have shown that the system can furnish with its new burner about 100 candle-power for the same consumption of gas as in the records cited above gave only 60 candle-power.

Apropos of Mr. Brackett's paper, concluded in our last issue, it is a printing point that our craft's greatest scientist, Dr. Wm. Spottiswoode, President of the Royal Society, particularly distinguished himself by his papers on "The Polarisation of Light." By the way, Dr. Spottiswoode's experiments and abundant scientific work and his constant hospitality in London or Sevenoaks, in Kent, was not accompanied by any weakness in business control. He was a strong business man, and the years when he ruled at the King's Printing House were, I believe, years of constant expansion and of large profits. He took control in 1856, when but just past his twenties, and he died in 1883.

Which leads me on to mention a remarkable piece of line work, remarkable for the interest of the subject and for the beauty of the execution. It is a 7½ × 9½-inch line engraving (folded), repro-

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ducing a page from William Strahan's account book. It figures in a most distinguished brochure compiled by Mr. R. A. Austen-Leigh, one of the directors of Spottiswoode & Co. Ltd. It immediately precedes the opening letterpress. There are over 2000 ruled spaces in this sheet, and William Strahan's figures in these spaces are neatness itself. I imagine that the account book must, after a hundred and seventy years, have been a somewhat difficult original, wanting a little handling, if it was to produce the perfect illustration sheet we see before us, and it is fair inference that every one concerned in this matter has done well. Everybody, beginning with young Strahan, who was so precise and so persistent in his account keeping.

He started in August 1739, and his receipts in his first year were £444. He at first made no sensational but still a very steady progress, and in 1766 he was, so far from being, like that year, all at sixes and sevens, that he was able to buy a share in the patent of the King's Printer. He had already printed *Johnson's Dictionary*, in which he may have had a proprietary share. He left £100,000 at his death in 1785, a year after the death of his friend Johnson. The business came to the Spottiswoodes, Scotsmen and close blood relations, in consequence of the failure of male issue in the Strahan line.

This brochure gains immensely in its interest from its other engravings. They include one short terrible letter from the printer and engraver Franklin to the printer Strahan :—

"Philadelphia, July 5, 1775. Mr. Strahan You are a member of Parliament and one of the Majority which has doomed my country to Destruction. You have begun to burn out Towns and murder our People. Look upon your hands! They are stained with the blood of your Relations. You and I were long friends :—You are now my Enemy—and I am, Yours, B. Franklin."

Another good line illustration is a thickly written receipt by Dr. Johnson for £150 paid by William Strahan for the copyright of the *Journey to the Hebrides*. The old boy's hand was firm enough, really remarkable indeed, considering that it was written within a few weeks of his death. But it recalls to me a passage from his diary. With so-and-so and such and such to do, "shall I not," he asks, "have work enough?" And he breaks out in a lament, "If I *had* but good pens."

The Cycloramic Camera which is being handled by the Photochrom Company and the *Daily Mirror*, and perhaps by others, has been much in evidence during the Coronation celebrations. The *Daily Telegraph* has repeatedly made avail of it, always successfully, and always, I believe, with acknowledgment of the Company named as the actual photographers. A sporting daily was less careful, though not less scrupulous. It paraded in its window a fine view of Ascot race-course. By the "Photochran" Company the underwritten acknowledgment informed us. It didn't "get 'om" that time. F. COLEBROOK.

Index of Current Literature. With Comments.

"THE BRITISH PRINTER," April-May 1911, has an article on the Huebner-Bleistein patents, together with the first English specimen of offset half-tone work done by this process. This sample is done on smooth paper, and therefore could equally as well have been done by letterpress three-colour. It is also, in the copy in front of us, badly out of register. Other articles of interest are "Some Peculiarities, etc., of Hand-made Paper"; "Elasticity in Platens: its Effect on Process Blocks"; "Care and Use of Printers' Rollers."

Process Work and Electrotyping for July has notes on two process pioneers, George Meisenbach and Karl Klič. The questions and answers deal with streaks on wet plates; sharp etching bath for zinc; developer for photographing on wood; working glue for dry plates; wearing quality of half-tones; weak negatives; and cracking of zinc.

The Inland Printer for July has an article on "Printing Photogravure and Type in one Impression," by S. H. Horgan; "Half-tones on Flat Writing Paper"; "On Stripping Negative Films"; "Marks for Air Brush Work"; "Offset Transfers"; and on "Prosperity for Process Work."

The National Lithographer for July has an article on "Rapid Photogravure," and also one on "Good and Bad Half-tones."

The American Printer for July has notes (with examples) on "Silhouetted Half-tones," also on

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"Vignetted Half-tones," and on "The Business Side of Photo-engraving."

The Master Printer for July has an article by H. D. Gatchel on "The Photo-Engraver."

The Engraver and Electrotyper has a biographic note on F. E. Ives.

. . . . . .

The writer of "Hints and Wrinkles" in *The Printers' Sales and Wants Advertiser* says: "A new special postage stamp rotary printing machine has been designed by Mr. Goebel, of Darmstadt. The first machine has been supplied and is now in regular use in Berlin. While postage stamps have hitherto been first printed in sheets and then perforated in rows, on special machines, this new machine does the work completely at one operation. It delivers the stamps printed and accurately perforated. The web of paper does not move forward intermittently, to permit perforation while the paper is stationary, but it runs continuously. Perforating pins must, therefore, travel with the paper while the actual process of perforation is carried out, and then return to the starting-point. We understand that Messrs. Hunters Ltd., of St. Bride Street, E.C., have the handling of this invention for this country."

The Empire Press Exhibition.

PROCESS PLANT IN OPERATION AND MUCH ENGRAVING INTEREST AT THE WHITE CITY.

A PLEASANT feature of the later Coronation celebrations, for so it may be regarded, was that which was witnessed when His Highness the Duke of Teck, Her Highness the Duchess, and the members of the council of the White City gave a luncheon at the White City in honour of the Parliamentary representatives of our Oversea Dominions then sojourning in London, and later in the day His Highness, in the midst of a representative journalistic company, formally opened the section of the Exhibition which had been devoted to the newspapers of the Empire. At the former of the two functions the proceedings were brief, the speech-making being confined to a cordial address of welcome extended to the visitors by His Highness on behalf of their Exhibition hosts; but in the Newspaper Press Section, where the Duke and Duchess were received by the Hon. Harry Lawson, M.P., the chairman of the Sectional Committee, their Highnesses found so much to interest them that they spent quite two hours in an inspection of the outstanding exhibits.

To the luncheon of welcome given to the Parliamentary representatives of our Dominions across the seas there sat down in the Garden Club a company of about 130 ladies and gentlemen. The Duke of Teck occupied the chair, having on his right Sir Richard Solomon, the Duchess of Teck, the Duke of Argyll, Sir Mackenzie Bowell, Lady Solomon, Sir Francis Hopgood, Lord Blyth, Lady Hulett, Mr. Imre Kiralfy, and Sir J. Liege Hulett; while to the left of the chair there were seated in the order named Lady Molteno, Sir William Hall-Jones, Sir William J. Lyle, Lady Hall-Jones, Sir J. P. Molteno, Lord Rotherham, Lady Hopwood, Mr W. Warren, Sir John Quick (with whom was Lady Quick), and Lady Rotherham. Included in the remainder of the company were Sir John and Lady Cockburn, Sir E P. Solomon, and Sir Charles and Lady Rivers-Wilson. After the toast of "The King" had been enthusiastically honoured, the chairman, welcoming the guests, said the past few weeks have been chiefly occupied in bidding a welcome home to the Sons of the Empire, who have assembled from over the seven seas to witness the impressive sacrament of the crowning of King George, and nowhere was this welcome more cordial than to this Coronation Exhibition, which had been devised in homage to our monarch and in honour of that Crown which is the pledge of our imperial unity. It took the King nine months to perform his historical beating the bounds of the Empire in the Ophir. It would take the ordinary traveller a much longer time to perform the same feat, but the public in that Exhibition might see the wonders of the Empire, might converse with the inhabitants of every clime, and watch them at their daily work in the short space of a day.

EMPIRE PRESS EPITOMISED.

At the entrance to the Empire Press Section there assembled, in readiness to receive the Duke and Duchess of Teck, the Hon. Harry Lawson, M.P., chairman of the section, and the members of the Section Committee, consisting of representatives of all sections of the Press of the Empire. On arrival of their Highnesses, Mr Lawson, as chairman of the section, read the following address to the Duke of Teck:

"On behalf of the Committee of the Press Section, representative of the leading journals of the British Empire at this epoch-making Exhibition, permit me to tender you a sincere expression of our gratitude for your presence here to-day.

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"May I remind your Highnesses that this is the first time in history that a section of a great Exhibition has been devoted to the Press? How well the idea conceived by Mr. Kiralfy early in the year has been realised will be apparent to you when I state that the exhibits are representative of all branches of journalism.

"In this section there is illustrated in effective manner the methods by which a modern daily newspaper is evolved; while in striking contrast are to be found old-time presses and the first rotary machine ever invented, the predecessor of the powerful machines which to-day print and fold hundreds of thousands of copies of newspapers per hour. Methods of illustration are also very fully demonstrated, all the processes from photography to the finished prints being shown in actual operation.

"Colonial, provincial, and sporting journals are well represented, while sketches, cartoons, drawings in black and white and colour by masters of pen and pencil, manuscripts of famous authors, messages sent out from Paris by pigeon-post during the siege, the *Mafeking Gazette* (issued 'shells permitting'), the *Antarctic Journal*, printed and bound in the Antarctic itself, and the first volumes of journals published upwards of a century ago, combine, I am sure you will agree, to make the Exhibition as interesting as it is complete.

"By this great Exhibition your Highness will realise the enormous influence of the Empire's Press, with its splendid history and glorious traditions, and its power for good, alike in the home and in the affairs of the nation.

"I now ask your Highness formally to declare the Press section open."

The Duke of Teck, in reply, said it was a matter for congratulation that this representation of the Empire—a great Exhibition instituted as a tribute of homage to the King in this epoch-making year—should be the first great Exhibition to devote a section to the Press. It was fitting that this should be the case, for without the means of diffusion of information afforded by the Press the great family of self-governing nations which constitute the British Empire could not continue to exist. It was the Press which rendered the stability and endurance of so vast a social organisation possible. At no time could such a recognition of the part played by the Press in Imperial affairs be more appropriately emphasised than at the present, when all sections of the Press were loyally working together for the drawing closer of the ties of Imperial kinship. In modern civilisation, nothing was more striking than the advance in the methods by which the great organs of public opinion were to-day produced. Might he be permitted also to compliment British journalism on the correspondingly high level of character and literary excellence which it had achieved? In the confident belief that this section would prove a source not only of pleasure, but of education to the great public of this country and the innumerable visitors, he had much pleasure in formally declaring the Press section of the Coronation Exhibition open.

The Duke and Duchess, conducted by Mr. Lawson, made an exhaustive tour of the section. All branches of the Press were represented—the great dailies at home; the leading journals published in our Oversea Dominions; newspapers that devote themselves primarily to pictorial illustration; journals that give their chief attention to every sphere of sport; and periodicals whose principal aim is to record the doings of fashionable society. In addition, the section constitutes an extremely valuable object-lesson. Messrs. Penrose & Co. have a complete process plant in operation upon the stand of the *Sketch* newspaper. Of great historical interest, too, is this Newspaper Press Section. Hard by the entrance, for example, at the exhibit of the St. Bride's Foundation, is a printer arrayed in the quaint garb of the first members of his craft, and busily engaged at an old hand-press—itself a relic—in turning out a facsimile of what was probably the first newspaper in the modern sense of the term that was ever printed—the "Niewe Tijdinghen," originally issued at Antwerp in the year 1616.

Then there are on view all sorts of exhibits that have distinctive literary interest. There is, for example, the famous "Punch" dining table, on which are carved the initials of many of the most celebrated contributors to that journal. Various original manuscripts and many portraits also add to the interest of the collection. At the stand of the *Daily Telegraph*, for instance, there are portraits of Mr. J. M. Levy, the founder of the paper, Lord Burnham, Mr. Harry Lawson, together with those of such distinguished former contributors to this journal as Mr. George Augustus Sala, Sir Edwin Arnold, and Mr. Clement Scott. Nor should mention be omitted of the remarkably comprehensive collection of sporting relics and trophies of all sorts which have been brought together by such journals as the *Sportsman* and *Sporting Life*. These include the actual craft in which Oxford won the last boat race in record time.

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A New Way of Working the Half-tone Process.

THE GLASS TO BE EMBOSSED.

As most people know, the half-tone process is at present worked with a ruled screen, forming a network of black lines, placed in front of and at some short distance from the sensitive plate. There have been suggestions by hopeful inventors to combine the screen with the plate. For instance, writes the contributor of "Printing and Process" in the *Stationery Trades Journal*:—"One inventor forms screen lines on the glass plate, before coating it with the sensitive emulsion; another inventor mixes with the emulsion grains of opaque and inert pigment, which break up the light and cause a corresponding grain to be formed on the plate. Palmer's patent, referred to some time ago in these notes, proposes that a black ruling should be imprinted on the back of the plate. Now a German inventor, R. Widmann, seeks to obtain a screen effect in the plate without having any black lines or opaque pigmentary grain. His idea is, so to speak, to emboss the glass by etching the lines, dots, or grain points into relief, and then to coat this embossed glass with the sensitive emulsion. It is presumed that if the plate be exposed with its back towards the lens, the light passing through the glass and through the elevations and depressions embossed on the film side will be broken up into a half-tone grain. This embodies practically the same principle as the Metzograph grain screen which is well known in the process trade. This screen is a glass plate embossed with a grain, and it is placed in front of the sensitive plate.

"It is difficult to see any advantage in these combination screen-plate methods over the use of a separate screen. They must necessarily be expensive, as the glass must be prepared with a screen for every plate, and, after all, they accomplish no more than the separate screen, whilst perhaps not serving so well. The only possible advantage would seem to be for making half-tone negatives away from the process studio, in taking views direct from Nature. It would make the apparatus more portable and convenient than it would be if a separate screen had to be carried. But the little that would be gained would probably have to be set off against risks of spoilt plates and the necessary retouching which would have to be done to bring the blocks up to the standard of those reproduced from good photographs or drawings. The regular half-tone process, as now practised, in fact takes a lot of beating."

Brevities.

FLEET STREET CHANGES.—Mr. William Will, managing editor of *Sporting Life*, has been appointed manager of *The Graphic* and allied publications. The editorship of *Sporting Life* has been offered to and has been accepted by Mr. W. Lints Smith, news editor of the *Evening Standard*.

AQUATYPE.—We have received an interesting specimen sheet in colour illustrative of the method of colour printing long familiar under the heading Aquatype, machines for which process are constructed by P. Orsoni, of Paris. This sheet is backed by a full statement in French of the working modus. The reader is told how five or six colours are applied at one printing. This specimen sheet bears a very clearly executed line cut of an aquatype machine, with a row of six brushes. We hope to deal with this subject shortly, this and all methods of quick production of simple colour effects for the less ambitious work being things we should never wholly overlook.

THE ILLUSTRATED PAPERS have continued to make special efforts to depict such great events as the Royal progress through London and the other Coronation aftermath happenings. In wide variety and interesting photographs well reproduced the *Sketch* has done excellently. The *Illustrated London News* has perhaps the finest pictures of the Naval Review. It has shown in colour the magnificent state coach used at the Coronation, and the unrivalled panels on the sides, painted by Cipriani. The *Sphere* has a huge plate illustrating the crowning ceremony as supplement to a splendid number of eighty pages, replete with photographic reproductions and numerous drawings by Mr. Byam Shaw and Signor Matania, its special artists in the Abbey.

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YORKSHIRE "WANTS NOWT," AND PROTESTS.—As a collector of postage stamps, with a keen eye to the value of curiosities, His Majesty the King probably is rather pleased with the new penny and halfpenny stamps which have just been issued: it is inconceivable that King George, or anyone else, can for any other reason welcome them. The portrait of the King is ludicrous, and the general design of the stamps is feeble and inartistic. Well might Mr. Evelyn Cecil invite the Postmaster-General to consider whether a fresh issue should be prepared. Another member caustically inquired whether the new designs could be "submitted to a small committee of competent persons before the actual expense of engraving is incurred." We have been served very badly, again and again, by the designers of our coins as well as stamps. The effigy on some of the later Victorian silver coins was ridiculous; there was a stupid blunder on the first Edwardian coins, and now we have these absurdly inartistic stamps. We regret the decision not to withdraw them, although he admits what everybody is saying about them. It is announced prominently that Mr. Bertram Mackennal is not responsible for anything more than the frame in which the King's head is placed, and that the head is a reproduction of a photograph. These explanations are interesting, but unfortunately they are useless. The stamps will have to be used if the Government will not let us have any better, but they will be used with regret and under protest.—*Yorkshire Post.*

"QUADS" ON THE NEW STAMP PRINTING MACHINE.—Happening in upon Messrs. Hunters Ltd., whence many an interesting trade topic has been gleaned, writes "Quads" in the *British and Colonial Printer*, treating of the subject briefly alluded to elsewhere in these pages, I learnt that a new special postage stamp rotary printing machine has been designed by Mr. Goebel, of Darmstadt, at the instigation of the Imperial State Printing Office, Berlin. The first machine has been supplied and is now in regular use in Berlin. While postage stamps have hitherto been first printed in sheets and then perforated in rows, on special machines, this new machine does the work completely at one operation. It delivers the stamps printed and accurately perforated. Accurate register has been the great problem hitherto, and this seems to be a quite satisfactory solution. The web of paper does not move forward intermittently, to permit perforation while the paper is stationary, but it runs continuously. Perforating pins must therefore travel with the paper while the actual process of perforation is carried out, and then return to the starting-point. The conquest of the technical difficulties was greatly facilitated by the way the State Printing Office placed its special experience, and particularly its knowledge regarding the heaviness of the impressions, at the disposal of the engineer. Practically it reduced his trouble to the elements of a purely mechanical problem. Mr. Goebel, who by the way won two Grand Prix at the Brussels Exhibition, was able to incorporate several mechanical devices for which he already held patents, but, in addition, quite a number of new movements or new features for this machine are, as I hear, in course of being protected by further patents. In No. 40 of the *Papier Zeitung*, Dr. Nikolaus, of the State Printing Office, gives a detailed description of the machine, and from this it is pretty evident what abstruse and subtle printing technicalities have been involved. A very special consideration has been the production of suitable inks. I am told that the obstacles have been overcome, and the production of stamps in rolls, for automatic machines and stamping or any other machines, is far cheaper and more satisfactory than was the laborious method of joining up the sheets. The machine produces the stamps already done up into rolls and at the rate of 3000 stamps per minute; and an increase in the output to double this quantity is contemplated.

A COLOUR-PRINTING EXHIBITION.—The exhibition of examples of colour printing, old and new, recently held at the St. Bride Foundation Institute, was a very interesting and instructive one, the arrangement of which reflected great credit on the Technical Librarian of the Institute (Mr. R A. Peddie), to whose initiative, we believe, the display was due. The large hall, and a smaller room adjoining, were furnished with long tables covered with books containing colour prints and loose prints, whilst a large number of framed specimens hung on the walls. In examples of early processes, such as chiaroscuro, the Institute is not at present particularly rich, and specimens of some other methods, like Le Blon's three-colour mezzos, are almost unobtainable in the ordinary way, but from the commencement of the nineteenth century, represented by Savage's *Decorative Printing*, the Foundation possesses a practically uninterrupted series of examples of colour work, including a good collection of prints by Baxter, his licensees or rivals, whilst other similar processes, such as those of Knofler, Evans and

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Vizetelly, are also well represented. The photo-mechanical colour printing processes are the growth of the past twenty years, but nevertheless really early examples, say of 1893-5, are by no means easy to come at. Their importance and interest are now, however, being recognised, and the Foundation showed several specimens of that period. Of the more recent methods employed in the production, for instance, of the Rembrandt Co.'s and Saalburg's multi-colour photogravures, the "Medici" prints, and three-colour half-tones printed from offset presses, there were many fine examples. An exhibit that excited much curiosity was a three-quarter length portion in a heavy gold frame, hung in the small hall. To all appearances it it was an oil painting, mellowed by time, but the writer was assured that it was a modern colour print reproduced from the original, a canvas grain having been imparted to it after the colours had been applied. From this point of view it was a veritable *tour de force* of the twentieth century colour printer's art. Many interesting bits of modern colour work were lent by the L.C.C. School of Photo-Engraving, and other loaned exhibits included some of the beautiful photogravures printed in colours at Compton after pictures by the late G. F. Watts, R.A. One would like to have seen the Exhibition more numerously attended than was actually the case, but its short duration necessarily militated against this. Perhaps a little later on the Governors could arrange for some show of this kind to be open for a week or two.—*British and Colonial Printer.*

THE HARRYING OF HARRISONS.—Now that the new issue of English postage stamps has begun to circulate and is being more widely discussed, there can be no doubt that its poverty of design and execution (says the *Daily Mail*) are causing general disappointment. The *Mail* thinks that Mr. Mackennal, whose name has been associated with the design, can hardly be blamed, as he is not responsible either for the portrait or for the wretched engraving and printing. He has merely drawn the borders, which are the best part of the stamp.

But here the matter does not end. The King's head, inartistically cut off the trunk, is engraved in a manner wholly unsuitable for the printing process employed. The lines of the shading, especially in hair and beard, are much too close, so that after a few impressions they get clogged with ink and make the whole portrait appear smudgy. At the same time the engraving is coarse, the design crowded and lacking in one quality, which should be the chief consideration in a postage stamp—clear legibility of the denomination.

The truncated head has long been abandoned by all other countries, the bust-portrait being substituted for it. In addition to all other objections there have already been complaints about the insufficient gumming of the backs of the new stamps, which, taken all in all, are the most unsatisfactory and unserviceable issue to be found in any country at the present moment, although they have this advantage over their precursors, that the value is expressed in figures. It is a strange fact that no English stamps have ever approached in beauty the first issue of Queen Victoria's reign.

"The new stamps are poor in design and workmanship," said Sir Luke Fildes, R.A., to a representative of the *Mail*. "It is only a very precious gem that can carry off so heavy and elaborate a frame as theirs. If you took the head out of its perforated frame you could not tell that it was the King at all, the likeness is so bad. The penny stamp is a little better than the halfpenny one, and the registered letter stamp, white in high relief, is quite passable.

"I don't like the frame. It is too heavy. By itself it is not so bad as conventional decorations go. But it does not suit the head. Somebody official, with no artistic sense, has been putting his finger in the pie. Perhaps Mr. Samuel had them made too cheaply."

The *Mail* received the following messages from leading artists in reply to requests for their views:

HERKOMER, R.A.—"The new penny and halfpenny stamps are bad in every way—in design and more especially in the method of reproduction."

MR. JOHN LAVERY, A.R.A.—"The new stamps are very good and worthy of the designer."

THE HON. JOHN COLLIER.—"I do not like the new stamp, but Mr. Mackennal's design is receiving so much criticism that I do not wish to add to the amount."

MR. WILLIAM NICHOLSON.—"In reply to your inquiry—'Too expensive.'"

"We desire," says the *Spectator*, "to join in the hope which has been expressed that it will be found possible to replace the new 1d. and ½d. stamps by a worthier design. The new stamps are petty and undistinguished to an almost provocative degree."

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Estab. Jan. 1894.
"The Process Photogram."

THE PROCESS ENGRAVER'S MONTHLY
THE PROCESS PHOTOGRAM ESTABLISHED JAN 1894

VOL. XVIII. No. 213.
SEPTEMBER 1911.

AND ELECTROTYPER'S AND STEREOTYPER'S REVIEW

A Patent Challenge.

A LITTLE matter has arisen in which we are very glad to join with Messrs. Penrose in seeking, as they are doing through their *Process Work*, a piece of trade information which may prove of considerable interest. It is as to how early were there advertisements or announcements of any kind which could be called "publishing," the substance of which was an offer to send out process engraved plates ready underlaid or otherwise made ready. If evidence of no very early announcement can be produced there may be an awkward episode, or at least an ambiguity and a doubt, not "forwarding" to trade. By "early" in this connection we mean anything prior to 1899, which, to be sure, seems but the other day. An American inventor patented in the United States in that year a method for which he made the following claim: "As a new article of manufacture—a relief printing plate having a permanently formed graduated printing surface," and the inference is involved that if the patent can be sustained photo-engravers will be prevented from sending out cuts with underlays between the block and the plate. After the Bell (Australian) patent, the Albert-Galvano process (both for make-ready in the plate), the Arthur Cox interlay, and a back plate routing modus, it is a little startling to hear this doubt raised, only that we are used to be startled in the process world. Will any reader who can tell of work being done along either of these lines before 1899 let us hear from him?

How some Grey Borders are Made.

MANY of the illustrated weeklies are using occasionally a grey border around their half-tones that is very harmonious and attractive. On examination under a glass it is found that this border is made up either of fine lines or dots. The way these results are produced (says the *British Journal of Photography*) is to have the border designs drawn in black ink on white board as for a line drawing; they are then focussed to scale and photographed through a screen. Sufficient exposure is given to ensure the high-light being completely closed (the screen may be racked out to do this if desired, and then replaced in correct position). Then a piece of white blotting-paper is held up in front of the copy while exposure is made, with a small stop to give a dot all over the design. This gives a grey effect by dots. If a line effect is wanted, the same procedure is adopted,

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but a slit stop is used, which gives a single line instead of a dot; or, of course, if a single line screen is at hand it may be used instead. The negative should be stripped and placed around the half-tone negative so that picture and border may be etched as one block. These effects are sometimes described as two-colour effects from one printing, though this is not strictly accurate, as there are not two colours, but simply two tones of one colour.

The Family Circle of a Great Firm.

DR. WILLY MERCK, of the great chemical firm of E. Merck, Darmstadt, recently celebrated the twenty-fifth anniversary of his entry into that city-of-a-firm as a partner. The occasion was made a festive one, and all work was suspended for the day. In the morning employés and workers assembled in one of the buildings of the works to bear testimony by their presence and their congratulations, to the *entente cordiale* which exists between owners and employés, and which is characteristic of Merck's. Dr. Willy Merck was the recipient of a magnificent art glass vase presented to him by the employés. The workers, of whom he is the direct chief, as the whole of the manufacturing (as well as the scientific) laboratories are under his personal supervision, expressed their congratulations in an illuminated address.

Representatives of the Hessian government, of the town of Darmstadt, and of numerous chemical works, joined in the shower of congratulations. In the name of the Grand Duke of Hesse (a son of our Princess Alice) the representative of the government handed to the "Jubilar" the Grand Gold Medal for Art and Science conferred upon him in recognition of his services, not only in promoting the advance of chemical research work and in developing this branch of the country's industry, but also as a distinguished patron of art.

In the evening employés and owners joined in a "Kommers," and the day closed by celebrating the event in true German fashion within what might be termed "the family circle of the firm."

This wonderful firm dates back to August 26th, 1668, when the then reigning Landgrave of Hesse granted Frederick Johann Merck the right to exercise his profession of pharmacy. The family succession has been unbroken. Emanuel Merck, who succeeded to the family heritage in 1816, was the one who transformed the pharmacy into a world-wide concern. About sixty years ago the manufacture of silver nitrate, pyrogallic acid, and chemicals galore was added to the firm's activities. When the old works had spread over twenty acres and still were inadequate, wiseacres were availed of, careful forecasting was made, and the bold step of entire removal was adopted. The new works, a mile north of the town, occupy seventy-five acres.

There is a rising colony of model dwellings for the workmen. It is, in fact, a self-contained town with a population of physicians, chemists, pharmacists, clerks and workmen; it possesses its own electric power station, gas plant, water supply, carpenters' shops and smithy, besides various repairing shops ready to cope with any unforeseen emergency.

The buildings on each side of the main entrance constitute one of the architectural

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features of Darmstadt, which prides itself on being an artistic town. These contain the chief offices and the scientific department, with its well-equipped library.

For the staff there are sickness and pension funds, and every year witnesses a number of "jubilees" of the twenty-fifth or even fortieth anniversary of the entry of some employé into the firm. These events are always duly celebrated, partners and staff meeting together to spend some hours untrammelled by the routine of work, and on these occasions the factory band and the different glee clubs vie with each other in their efforts to make the evening a success. By the way, upon the advent of a "new citizen" in the home of one of Merck's workers, the mother receives a gift of money.

A Cerberus vigilantly guarding the exit of every product is the control laboratory, through which every preparation has to pass and comply with rigid tests before being deemed worthy of going forth bearing the name of Merck.

Miles of railway lines intersect the factory, directly connecting it with one of the chief arteries that link up northern and southern Europe.

Some Difficulties in Large Colour Work.

By "Chromo Sum."

A STEADY change is taking place in the means used for the production of large-sized colour work. Photomechanical methods are being employed more and more. Not that this may be taken to mean that less chromolithography is being done, but rather that much of the increasing volume of work is being executed by process or by the application of process to lithography. One sees signs of the change in the many Christmas coloured supplements and other large prints now being produced by three-colour instead of lithography, and recently some quite large and successful results have been seen.

Of these perhaps the most striking the writer has seen is the framed portrait of the Austrian prince exhibited by Messrs. Hunters Ltd. on their stand at the late printing exhibition and now to be seen upon the wall of their manager's room at 11 St. Bride Street, E.C. This print is about 26 × 35, if I remember dimensions accurately. It has all the appearance of an oil canvas; for after the three-colour printings had been applied a graining was added to give the picture a canvas appearance. The silvery hair, the flesh, and particularly the light blue eyes of the delightfully human old dignitary, have all been most successfully produced. The picture was shown a few days ago to the head of an immense art printing or publishing house in America. "This is the most remarkable thing I've struck on this side the Atlantic," he said, after careful inspection. "At the same time," he added, "I incline to say it is not a print from one plate. I think there are four plates here; that there are joins in the dark shadow parts where they can be more easily concealed. I think it is a litho print from four half-tone transfers." I understand that these surmises are wrong; that the German printers did produce this portrait from large three-colour half-tone plates. As, however, they represent the suggestions of a very able director of works producing

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both half-tone and litho, I think his surmise worth noting.

Collotype, in spite of its uncertainties, is being used to supplement or even replace lithography for some classes of good works. Machine photogravure also appears to be making a fair bid for popularity as a means of obtaining coloured reproductions of pictures.

Such photomechanical methods, however, offer many difficulties which have to be overcome. One of these is only too frequently seen in the red edges to objects in the marginal parts of the print; not a red edge produced by a want of register in printing, for which there is but little excuse, but an edge due to a want of fit of the component blocks. The trouble arises from the difficulty of making three or four negatives of large size, say over 15 inches, with different coloured lights which shall be of exactly the same sizes. The difficulty is being gradually overcome by attention to the optical parts and to the rigidity of the camera.

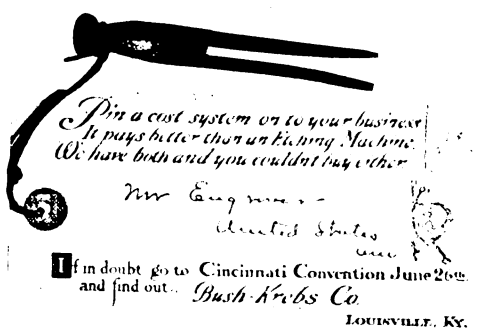
The large size of cross-line screen necessary is another difficulty. No efficient substitute has been found for the cross-line screen with lines and spaces of equal width, although many irregular grains have been tried, and in the larger sizes they are difficult to produce and hence costly. The largest circular screen constructed is not of very considerable dimensions.

The permanence of the inks, too, represents a by no means solved difficulty. In litho work, especially where there are many printings, the inks may be chosen with regard to their permanence as well as their colour, and the scheme of printing so arranged that only those of the requisite fastness to light need be utilised. Where, however, the three-colour process is employed, there is not the same choice, and the red, or rather crimson, that must be used is of such a hue that it is difficult to obtain any approximation to it except among inks of low permanence. The consequence is that three-colour work is apt to fade on exposure, and this becomes of great importance in large prints, which are usually intended for use as pictures, and are not merely book illustrations which only occasionally see the light. The more permanent inks have, of course, to be used and their colour defects corrected in the process.

In spite of its handicaps, "process" is becoming a serious competitor to lithography, although the future competition is more likely to result in a blending of the methods than in much actual competition along the original lines. The colour rendering will probably become more and more mechanical by the aid of photography, the modelling of the pictures will depend less on the skill of the draughtsman, but much of the printing is likely to return to lithographic methods by the use of the offset process.

ONE FORM OF "PEGGING AWAY."

AN ADVERTISING WHEEZE FROM THE STATES.


Put a cost system on to your business
It pays better than an Etching Machine
We have both and you couldn't buy either
If in doubt go to Cincinnati Convention June 26th
and find out
Bush-Krebs Co
Louisville, Ky.

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The Wedding of Process and Litho.

By F. W. Plews.

Thankless originals by amateurs—Post card work—Available knowledge disregarded—The wedding of process and litho—Thirteen printing effects in five or six—Orange filters for post card work to give scope for litho—Direct and indirect, and both sub-divided—Details—Inks—Seasonal plates.

THE present popularity of the pictorial post card has every appearance of being permanent. When we are told that eighty per cent. of these cards are reproduced from photographs, in many cases the work of amateurs, a few hints about the best method to produce the most satisfactory results may be a great help to those who have to reproduce such trying originals.

During the course of my experience in this class of work (and I have had a great many card subjects to reproduce) one thing has struck me greatly, namely, the need for a better colour selection in taking the original photograph. Most amateur photographers apparently do not take advantage of the materials which the scientific worker along with the plate manufacturer has placed before the photographic public in recent years. We have had trade lectures, demonstrations and articles on the subject of orthochromatic photography, handbooks of various descriptions, but still we (the process workers) many times have copies to reproduce which untouched could never be made satisfactory, and even when retouched in many cases show the trail of the serpent.

I am not a purist in photography, but I say as regards the picture post card business, if we can obtain our copy photographically more perfect, then by all means let us have it.

Without going very deeply into spectrum analysis, most of us are aware, when using an ordinary plate, that blue rays unscreened are very strongly actinic when compared with the (D) or sodium line region of the spectrum, which visually appears to be the lightest portion of the spectrum.

The ordinary photograph gives, so to speak, a complete topsy-turvey result, the blues coming out white upon our print or in values of a very untruthful nature. The greens are decidedly under-exposed and the yellows are altogether too strong in tone, necessitating a considerable amount of retouching before the original can be reproduced satisfactorily. Still it is astonishing what beautiful results can be obtained by this method—shall we say by the wedding of process and litho?

The three-colour worker cannot yet afford to look upon this method with an air of contempt.

In conversation with a good many managers recently I have been led to alter my opinions concerning three-colour blocks, and even lithography too. They all in one voice speak of three-colour being too expensive for the general run of work; claiming too much attention from all concerned; with necessity for very close register. On one occasion I happened to have a few specimens made by the wedding of process and lithography—taken from water-colour and oil-paintings through a proper light-filter for the purpose. The objectors to the three-colour method who were discussing the matter declared this wedding to meet their ideal, and (for a good commercial method) to suit their requirements much better than they had imagined; and

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several of them at once requested me to produce for them showcards, etc., by the method I have recently practised.

I should state here, when this method is worked in a satisfactory manner the effect of thirteen printings is secured with from five to six printings for *high-class work*. I have recommended this process to more than one firm who are now working it on successful lines.

For post-card work the photographers who make the original photographs should use an *orange filter*. By so doing they will secure a photograph which will allow the litho artist unlimited scope to get a very good colour rendering of the original subject, and even to introduce a bit of imagination, so dear to the art critic.

A very good series of examples are to be found in *The Photogram* for May 1902, pages 130 and 131. The most casual observer will be at once struck with the amount of relief got by the use of an ortho plate in conjunction with a properly prepared filter. A more striking illustration would be got could these subjects be coloured by "the wedding of lithography."

Now for showcard purposes our object is to get a reproduction by photographic means which will preserve the life which the artist has infused into his work. The expression is more faithfully preserved by photography than by the ordinary methods of reproduction.

I try to reason the thing out, and proceed in this way. There are two ways at the present time by which we may obtain our requirements, namely, the direct and the indirect methods, and these methods, again, may be subdivided. The indirect method of procedure is as follows: Choose an ortho plate sensitive to orange, either panchromatic or otherwise. Copy the picture in the ordinary way through the orange filter, allowing a full exposure so that the light tints of blue are rendered fully on the plate. From this negative a P.O.P. print or glossy bromide may be made. From this we may proceed to make our final half-tone negative.

Suppose we choose the direct method, we may use either a panchromatic or a blue-dyed emulsion, whichever we choose to work with, but in all cases a fully-exposed negative must be made. This is then printed upon the copper or zinc plate, and etched. It will be found that very little fine-etching is needed.

If we decide to print from a lithographic plate we must make our half-tone negative very nearly closed up in the high-lights and light blues, etc. The amount of tone got by such means, and the ease with which it can be accomplished, makes this method at the present time a keen competitor with three-colour for the purposes named, when worked in conjunction with the lithographic artist by whose aid the colours will be drawn upon stone or grained paper in the ordinary lithographic manner.

A word or two with reference to the colours to be used. It is advisable to adhere to Mander's red and Berger & Wirth's yellow and blue (litho trichromatic colours). These give the best results. Any other make of three colours could be used, no doubt, with equal success, provided they would give when blended a good green, violet, and scarlet.

The half-tone process plate is printed in a bluish-black. A tint of light blue and one of pink in addition to the above will produce a work of art which can be put before anyone. For post-card work it is only necessary to use about four printings.

In the early part of spring and summer months the isochromatic screen should be used in an intelligent manner, and the

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method I advised of using an orange filter in conjunction with a panchromatic or Lumière B or a Gem tri-colour plate needs modifying.

In landscape work during the spring and summer months I strongly advise the use of a green sensitive plate in conjunction with a yellow light filter. For town work, and where buildings predominate, we could use in a general way the orange filter and plates explained previously.

How Collotype Work should be Carried Through.

By Walter Griggs.

Chemical agents and apparatus—The various gelatines—When fit—Potash *versus* ammonia—Anti-grease—The best support, and why—Use your actinometer—Operations detailed—The right drying-box arrangements.

Some acquaintance with the chemical agencies used in the collotype process and their application, and also with the apparatus required, will be found of considerable service to all who are professionally or otherwise engaged in this interesting work, making it easier to recognise and overcome difficulties when they arise.

"Hard" and other Gelatines.

The choice of a suitable brand of gelatine for the work, free from impurities, was for many years an impossibility. This difficulty has been removed, and the right gelatine may be obtained of fine quantity from dealers of repute.

It is technically known as "hard," "middle-hard," and "soft." With "hard" gelatine the formula gives excellent plates that are reliable for long "runs."

"Middle-hard" gelatine mixed with bichromate of potash and chrome-alum produces plates of a fine matt-surface which also yield long numbers in the printing machine.

"Soft" gelatine when by itself is unsuitable, but is frequently used in conjunction with the other brands.

When purified, the animal tissues from which gelatine has been obtained represent that substance in its purest form. Great improvements in this respect have been introduced by English and foreign manufacturers, Nelson, Creutz, Coignet, Henrich and others.

Creutz Preparation.

The article prepared by Messrs. Creutz is most generally used. The Creutz modus involves steeping in lime water, washing, bleaching with sulphuric acid, and washing again, the gelatine being finally extracted by steam, set to cool and dry, cut up, washed, re-dissolved, and finally again dried on sheets of thin wire gauze.

The "pits," or grease spots which give so much trouble in printing, are caused by the practice of greasing the knives to facilitate the cutting up of the gelatine.

How to Know when Fit.

Gelatine is insoluble in cold water, in which, however, it swells considerably, but dissolves readily at 100° Fahr. It is suitable for collotype when it absorbs water freely, and does not deteriorate if soaked for two or three days in cold water.

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Fish glue or isinglass is not so serviceable as gelatine, being less durable.

The different combinations of chromic acid in the shape of alkali bichromates of potassium and ammonium, in conjunction with such organic substances have great sensitiveness to light, and in a solution dissolved together at 135° and dried at 125° Fahr., give perfect collotype plates.

Bichromate of Ammonia: Poor Substitute but good Assister.

An excess of bichromate of potash is liable to crystallise either in the solution or in the drying-box if the temperature is too great, but bichromate of potash is preferable to bichromate of ammonia when used in correct proportion. Bichromate of ammonia in the drying-box is less liable to crystallise, but has many drawbacks, its tendency to cause insolubility being the greatest. A small quantity, however, added to the potash has considerable advantages.

Like Manna—not for Storing.

The chromated jelly is best prepared fresh each time it is required. Sugar increases its hygroscopic properties and heightens the sensitiveness of the solution. Chloride of calcium increases its dampness. Spirits of ammonia, chloride of lime, cyanide, etc., increase its solubility. Tannin, chrome alum, chloride of zinc are employed to harden the film.

Albumen in the proportion of one ounce to 14 ounces of solution rectifies and removes any grease which would otherwise produce "pits" or black spots.

Either glass, stone, copper, zinc or aluminium may be used at pleasure as a support for the emulsion. Albert of Munich was the first to use glass. Each has advantages and disadvantages, the consensus of opinion for working the process being in favour of plate glass $\frac{3}{8}$ths of an inch thick, the edges of which are bevelled to avoid damage to the swift-running ink rollers when printing at the machine, or even when working at the slower hand-press. These glasses can be purchased ready for use, the surface being finely ground on one side, enabling the substratum with the sensitive stratum to adhere more firmly.

Abroad, preference is given to the delicately green glass of Belgian manufacture as being harder and less liable to breakage. Breakage, however, seldom occurs. A supply from the nearest manufacturer will be all that is necessary.

The only legitimate "Back-stare" Business!

The advantages of glass are many, chiefly the opportunity afforded of watching the progress of the exposure by turning the frame over in a subdued light and looking through the back of the glass. With a little experience the depth of the insolation in tones of deep and delicate warm browns may be seen, the darker parts particularly being visible with their rich colouring.

When the more delicate portions are discerned, however slightly, the plate will be sufficiently exposed. An actinometer should be used when duplicate plates are required, strips of sensitised paper registering the exposure from small glass negatives of different corresponding densities. Notes and memoranda may be pencilled on the back for future reference. The record given by the actinometer is invaluable, as the quality of the light varies from day to day, even from hour to hour.

The Removal.

The plates are cheaply purchased, easy to coat in the drying-box or oven, and

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equally easy to adjust on the bed of the printing machine. They can be quickly re-prepared for new work. The printing ink is washed away with turpentine, and any greasy effect remaining scoured off under a tap of running water. They are next placed on a level bench, film side uppermost, and flooded with a sufficient quantity of hydrofluoric acid and water 1 to 6, using a hard hair-brush to distribute the solution to the edges. In a few minutes the gelatine frees itself in irregular patches from the glass.

When the gelatine is entirely removed the plates in pairs are ground together for ten minutes with fine emery powder and water, the grinding being carried out in circular motions. When finished and the plates have been scrubbed free from emery, they are rinsed with equal parts of spirits of ammonia and water, dried, and are ready for re-coating.

Another excellent way of removing the gelatine from the glass, though somewhat slower, is by soaking them in a bath of strong caustic soda or potash (lye), 1 lb. to 1½ gallons of water.

When sheet copper is used, the surface is ground with emery powder in the same manner as described for glass. Zinc plates are first cleaned with pumice powder and water, and then etched or grained for ten minutes by immersion in a bath of nitric acid 1 part, saturated solution of alum 15 parts, and water 85 parts, till they assume a grey colour. They are then well washed in clean water on both sides, using a pledget of wool to remove the grey scum (where the surface has been eaten away by the acid), and dried. Aluminium sheets are prepared by steeping in a bath of sulphuric acid and water 1 to 30. No substratum is employed when using metal plates as supports, the bichromated gelatine being coated direct on them. Whether glass or metals are used they must be carefully levelled in the drying-box, supported on $\frac{5}{16}$th thick bars of iron adjusted on ledges.

The Drying-box.

The drying-box or oven can be made any size corresponding to the required amount of work, suggested sizes being 6 × 3 feet or 3 feet square, of seasoned deal one inch thick and dovetailed at the ends to give additional strength, the bottom being of thin sheet iron. It should stand 6 inches from the ground, the lids being made of strong open framework, hinged to one end, and covered on the inside and outside with black gauze material to allow the hot moist air slowly to evaporate. When a large drying-box is used it should be divided into two compartments, each having a separate lid, hinged at each end, and both shutting to the centre. It should be about 18 inches deep, and inside the box, about 6 inches from the top, ledges of 1-inch wood are screwed to the sides. These are carefully levelled before fixing, and on them rest the iron bars which traverse the oven. These bars, in pairs, are fitted with screws which turn from below by hand—two screws to one bar and one to the other, forming an almost perfect triangle. On the points of these three screws the plate rests for levelling, which has to be carefully done, otherwise when a coated plate has dried the solution will be found to have run to one side or to one corner.

The temperature of the drying-box should be 125° Fahr.; a thermometer should be inserted at one end of the box and on a level with the surface of the plates.

Heating.

The heating power can be supplied by atmospheric gas jets—three or four 2-inch

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pipes fitted below the iron bottom, and cased round with iron sheeting in which are one or more small doors opening outwards through which to pass the taper when lighting. The gas pipes extend the length of the oven, each provided with a separate tap, with the burners fitted about 1 inch apart. When this system is adopted the bottom of the drying-box on the inside is covered to a depth of 1 inch with fine silver sand to assist in distributing the heat more evenly.

The hot-water heater is commendable for the regularity and uniformity of the continuous supply of hot water, maintained by the circulating hot-water pipes of 3 to 4 inches diameter, the heater or boiler being fitted with powerful bunsen burners and placed about 2 feet from the drying-box. The pipes, being at one inch incline from the further side, assist the flow on its return to the boiler. The highest part of the barrel above the boiler is fitted with an exhaust which can be carried to the cold water supply tank.

The electric heater in the drying-box of the collotype class of the L.C.C. School of Photo-Engraving and Lithography (the first one constructed for use in this process) is manifestly excellent for its purpose, and a valuable object-lesson in progressive installation.

A fine wire gauze netting in convenient sections covers on the inside the bottom of the drying-box, catches all spilt bichromated solution, etc., and is easy to remove for cleansing.

The drying-box should be fitted in a darkened room, away from all daylight.

A few Useful Hints to Press Photographers and Process Engravers.

By "St. Mungo."

These few notes are intended for beginners and amateur press photographers; with a few notes, too, for the process engraver who may be single-handed or needs a little advice from one who has gone through the mill.

ONE may be excused for asking, Is this an age of mediocrity? If one is a news engraver his answer is likely to be "yes." The press agencies, who ought to know better, do not make a much better show than the poor amateur with his lack of experience in turning out really good work. Dirty, slovenly work and (photographically speaking) prints which never ought to have gone further than the negative stage, I have seen during the present exceptionally heavy year—due to the Coronation festivities, etc. It has occurred to the writer that a few words upon this subject would not be out of place. The writer has had a few years' practical experience in all branches connected with news illustration, and is in a unique position for offering a few suggestions on the process generally, from the making of the original photo to the finished half-tone block.

The present-day practice of sub-dividing the work is no doubt a good system, but if one has gone through the lot, then his task is much more simple when faults occur in the various manipulations, and such a man can at once place his finger on the real cause of the mischief, and the error can be rectified in the proper quarter.

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It must not be thought that I am about to relate my own views entirely on this matter.

Let it be at once understood that I keep an open mind, always ready to listen to the methods and experiences of others I have met, to give trials to the ideas of others. I adopt any system which promises better than my own.

It is to the beginner my notes will be of the greatest interest, because I believe the regular press photographer is hopeless to redeem.

I have had many discussions with experienced workers as to the merits of a short-focus lens and medium and long-focus lenses, but at the outset I will advise those able to get all, to do so. The short-focus has its points, crisp definition and depth of focus being two distinct advantages, and a negative of this description will stand a great amount of enlarging. The longer focus lens is apt to give a more woolly image, and requires more accurate focussing.

For football work I have used all, but if one can get permission to stand behind the goal line then I would advise the use of a medium or a short-focus lens for such work and general newswork also. Anything taken on or within the eighteen yards line may be enlarged to two, three, or four columns according to the incident and number of figures on the plate. The type of camera I use is a folding one with focal plane shutter and lens which works at *f*/4·8, anastigmat type.

Life and action are what editors require for news photos; posed photos do not so readily get accepted.

In dull weather allow the longest exposure possible, and rely on the developer to get the best result. In cold weather I generally warm the developer slightly. Do not overheat, otherwise the negative will be granular.

My favourite developer is the Imperial Standard, with the addition of one-third more water when mixing for use. The part of the process where most failures seem to beset the amateur is in the printing. I have had all qualities of prints to reproduce, red-toned P.O.P., matt bromide, velvet bromide, carbon platinotype, rough bromide, etc. I cannot over-emphasise what I have got to say about this part of the process. Discard all papers except the glossy bromide. I have no hesitation in saying this is the ideal kind of paper to use for the object in view. Upon this class of paper process photographers have but one opinion—"the best." In making your print or enlargement secure as much detail as possible, and the engraver, if he knows his work, will get the brilliancy required. Amidol is a good developer for bromide paper. After fixing, rinse and place the prints in formalin or alum. Then wash for a minute or two and squeegee on to ferrotype, and the prints may then be dried off by gentle heat and should leave the plate in about two to three minutes.

Why I wish to impress this part of the process upon my reader is because I have come across amateur press photographers making ideal negatives for this class of work and their prints have been rejected because time could not be allowed to make them presentable for reproduction.

To sum up for this part of work, I would advise that you get a negative of medium density, print as much detail as possible on glossy paper, and let your print possess pure whites in highest lights only and pure black only in those places required to give a little emphasis. The hard black-and-white print is not wanted, neither is the washed-out sickly-looking one,

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although one may get a fairly passable block from such prints. I strongly advise one to aim for the ideal, and I am sure such poor work as I have seen lately will speedily become a thing of the past.

The next stage of the process is the retouching. Unless a photograph is hopeless, I prefer to leave it untouched and utilise my stops to make an improvement when making the tone negative. For painting out backgrounds in portraits, etc., I generally use flake white; ground up very fine with gum and a little glycerine added to keep it in moist condition. This can be kept for weeks in a wide-mouthed corked bottle. To make grey grounds I add a little of this white to a little black. Any strength can be made to suit the requirements for the particular subject in hand. In using aerograph I find chinese white better. When I require a touch of pure white I use process white. Ordinary indian ink I use for touching in details. It will no doubt be necessary to add a little ox-gall to make the colour flow evenly. A broad style of treatment generally succeeds best for news work.

I then proceed to make the tone negative. A little extra care and thought displayed at this stage (where the process worker takes the work over after its leaving the photographer) will make itself felt in the final result. I have seen operators fail half the time in negative-making simply for the want of a proper understanding and system. I keep to a fixed screen distance and vary the stops only, thus entirely dispensing with two factors in our calculations—that of exposure and screen distance with relation to stop. I have marked the camera stand permanently where the camera should be for same size. This makes a good basis for calculations later, when other sizes are required.

For an illustration say our copy is full of tone and there are no very deep blacks, and the reproduction is required same size. For such a copy I should choose a cut-out corner stop equivalent to No. 4 Penrose's series, and working with enclosed arc lamps I should give a shadow exposure of, say, about 1½ minutes with a round stop marked *f*/45, which would be equivalent to $\frac{1}{90}$th the camera extension when copying same size.

Then I should use the cut-out corner stop No. 4 and give one minute with wet collodion developed with the usual iron developer, etc. The after-processes are well known.

Suppose I had a hard copy for reproduction, I should use either a square stop or a round one equivalent to about $\frac{1}{50}$th of the camera extension, and give 1½ minutes' exposure with a shadow exposure of 1½ minutes, with a stop equal to $\frac{1}{90}$th of the camera extension and a slight flash; same screen distance.

For reductions the stop will need modifying, but bear in mind there is no need to alter screen distance if you use the equivalent aperture, which one soon gets to know by practice without measurements. Copies having similar tones when worked on these lines require the same exposures. Exposures need modifying only where copies differ in tone.

I have personally used this system and advised its use by other operators, and they are all alike in their feeling in regard to it.

After the negative has been dried, I rule the border off by using a blunt piece of metal. I prepare the zinc plate by cleaning with a felt pad and finest levigated pumice powder and water.

There are two methods I use in printing.

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When time will allow I prefer to coat the plate with glue after cleaning with the pumice. This is a polished plate, but the only thing I can say against this is the lengthened time in printing, which is about ten minutes. The quicker method is to place it, after the cleaning with pumice, into the graining bath:—Powdered alum, 1¼ ounce; nitric acid, 1 dram; water, 1 quart.

Take out and place under the tap, clean all scum away with a pledget of cotton-wool, and proceed to coat with a well-filtered solution of sensitive fish-glue.

FORMULÆ.—Clarified fish-glue, 8 ounces; ammonium bichromate, ½ ounce; water from 16 to 18 ounces, according to quality of glue; ammonia (·880), 24 drops.

(To be concluded.)

The Huebner-Bleistein Machine.

PERHAPS a few additions should be made to the information we published last month regarding this machine with its aim to produce plates by a new method for the offset press. There are two Huebner-Bleistein machines, and in one of them plates of aluminium or zinc are coated—this coating, we may say, being by the ejection of a sensitive emulsion from tanks through a series of tubes, the plate being whirled the while. Of the second machine we gave so full an account that we need not allude to it further here, but we might add that when the printing has taken place (the first print taking about three minutes), the exposure being over, the plate is removed to the first machine for development, washing and fixing. The "square" of the strength of the sensitive emulsion governs the time of exposure and time of development; the fixing being a definitely calculated quantity, and uniform for all plates. The one mechanic and youthful assistant employed in the work will (it is anticipated) be able to produce the plates ready for the printing machine in twenty minutes after development. Apparently the business policy is to be, establishing works in this country to produce plates ready for printing. It is not proposed to do any printing, but leave it to trade houses to make profitable avail of the method.

These problems as to what is sound business policy in exploiting a patent or a secret are very interesting, and are matters on which it would perhaps be peculiarly foolish to dogmatise. A very large concern in America making an enormous number of three-colour plates has absolutely refused to sell a set of plates. Its contention is that itself is the best guardian of the credit of its plates. If they were faulty it of course would make others without extra cost to the customer other than might be involved in his having to wait. We all know how British policy has looked the other way. Sometimes the doubt crosses our mind as to whether the printer has been quite fair, has really appreciated the self-denying ordinance of the engraver who desires to work for the printer all the time; and to give the printer all the work he can influence. There are questions herewith connected proper to be revolved in these quiet and perhaps contemplative days.

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Facings and Pacings.

By "Ion."

WILL the reader turn to the little leader note, "A Patent Challenge," on another page in this issue, and apropos will he, being, as I presume, a foundry man, tell me how early newspaper stereotypers began the practice of imparting a relief to the zincos they have to deal with? In thus obliging me (for the editor) he may prove to be obliging himself.

A writer in that very versatile and useful publication *The Newspaper Owner* calls attention to the fact that duplicates of one or more wood letters are often required for a poster. Time is a consideration, so that quick drying and casting are necessary, and the letters are sometimes filled up with old coloured ink. He raises the question as to which is the best method to adopt so that the poster can be put on the machine with as little trouble as possible.

The most reliable method, and a fairly speedy one, he says, is to get the forme ready in the usual way for moulding, having the type as clean as possible. Next cut a piece of ordinary flong the size required to cover the forme. Before putting it on, oil on both sides a sheet of tissue, which should be cut into strips the size of each large letter or line of small ones, care being taken to keep the oiled tissue from touching metal type or clumps and to see that it covers all the wood letter; then mould as usual. The lid of the drying-box or chamber should be as hot as possible before putting in the matrix to dry. The matrix must only be left in long enough to thoroughly set, then it should be taken out and trimmed, any of the oiled tissue adhering to it being carefully taken off. The matrix may now be dried and cast from as speedily as desired.

The oiled tissue prevents the old coloured ink, etc., referred to in the question from sticking to the matrix, which, if properly handled, should be quite clean, and, if carefully made, any number of sharp casts may be obtained from it. Dents and hollows in the letters by this rapid drying process are, unless very deep, levelled up, as they are usually caused by hard bodies in the paper used in printing, and the steam caused by the damp flong being heated on the box generally restores the surface. Boxwood type and end-wood letter will break under this damp heat, and should not be stereotyped.

This is how Flowers' steel electros are being advertised in New York. His point selection may interest foundry men. Flowers claims them to be particularly suitable for "long runs; half-tone cuts with delicate vignetted edges; running heads of periodicals and newspapers; logotypes, imprints and all standing announcements; bag and cardboard work; red ink work. Steel electrotypes have a real and important place in the printing industry, and are proving their value wherever printing plates are required which must stand up under unusually severe conditions."

BEST wishes to Mr. G. A. Goodwin, late of F. Wetherman & Co., collotype printers, Enfield, who has commenced business on his own account in Wardrobe Chambers, 140A Queen Victoria Street, E.C., where he undertakes designing, collotype, half-tone and three-colour process, colour work by special methods for scientific and art purposes, and copperplate by the new offset process.

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To Prevent Disputes, Order Clearly.

It is a well-known fact in the trade, says the *Master Printer*, that more than one-half of the disputes between the engraver and the printer—either on price or quality—are caused by the giving of indefinite or insufficient instructions when ordering. In common with other engravers Messrs. Gatchel & Manning have suffered from this cause. As the upshot of the whole matter in any case is an expense to the engraver, either by a reduction of price or a "make-over," they have issued this little circular of instructions to parties ordering plates:—

"Important.—When requesting estimates or placing orders for engravings, drawings, designs, re-touching or artist work, as cost or expense represents the value of the time to produce a definite class—quality—finish of work, in order to obtain that which we consider to be best adapted to your requirements and furnish the proper 'value at minimum cost,' ALWAYS STATE SPECIFICALLY for what the finished work is to be used, and if for advertising, whether for:—daily newspaper, magazine, trade journal or catalogue, and specify or submit a sample showing the quality and finish of paper to be used in printing.

"Also state what 'CLASS' of work you prefer: Half-tone? Line? Combination? How many colours?

"'Quality' of work you prefer: Good? Medium? Best? (If you can—submit a sample to show.)

"'Finish' (of half-tone). Square? Outline? Vignette?"

The Wisdom of Ordering in the Quiet Time.

There are two or three people in London just now (writes the contributor of printing trade notes in that "journal for serious advertisers" called *Printers' Ink*), but, crisis development apart, there will be no one in London in a week or two's time. There will be nothing doing. The old wheeze will have to work again, and the inquiry "How's business?" be answered by the lifted hat and the sepulchral "Speak reverently of the dead."

"I make the mention to attach a hint. Is not the quiet and dead and silly season just the time when the advertiser might very well in his own interest keep the printer going? He would get better prices; he would get better attention. He would in that dull season be making his business, which in the later live season would be making him.

"Strange to say, I had just started on this last paragraph when in came a note from one of the largest houses in British printerdom. It was in reference to an order for an important catalogue to be executed for a firm abroad who had commissioned me to act for them in the matter. I had duly sent on one estimate, but this is what I received from one house which, other things being equal, should be just the firm to tackle the job: 'In the ordinary course we presume the order will be placed towards the end of the year, at our very busiest time, when we find it extremely difficult to cope with a

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large quantity of orders that are placed with us in connection with ——.' And they politely intimate that they will not quote.

"Of course, I am not going to give identifying words. But could anything come to hand more timely? To all appearance this job would have been differently regarded had it come to hand all ready to be started in August. It is a job running well into the three figures."

Mr. Hamburger's Colour-Photographs.

MR. HAMBURGER of the Dover Street studios, London, has been telling an interviewer something of his new process for obtaining true colour-photographs. He said:—

"This is the first time that a true colour-photograph has been printed upon one and the same sheet of paper without any touching up or transmitting.

"Hitherto colour-photographs have been reproduced by the three-colour process—the primary colours, red, yellow and blue, being laid one on the top of another and blending into something that will pass for the real picture.

"With this method, however, it was hardly ever possible to get a pure black or a pure grey. This we have managed to achieve. I must not explain the exact way it is done—it is a patent—but the result is a photograph that can be true even to the most infinitesimal details, and indeed cannot lie.

"Take, for instance, this photograph," and Mr. Hamburger held up a photograph of a lady whose complexion did certainly seem a little too obviously compounded of the lily and the rose. "Now, this lady happened to have 'made up' her face, imagining that the camera would not know. We implored her not to, but she was obdurate. So here you are, paint and all. Sargent himself could not be more candid!

"At the same time, where truth is beauty, the picture will be beautiful. You see this portrait of Miss Lily Brayton. It was taken immediately after her Australian tour. You will notice that she is a little sunburnt, but not a whit the less charming. Here is another of our triumphs—a lady in a black satin dress, with sleeves of black lace. You see how the delicate flesh tint shows through, yet without any blurring. If you were to look at it through a microscope you would see every thread of the lace.

"As yet, I am sorry to say, we have not been able to take any open-air photographs. Sunlight itself is too variable for our purposes, but a special flashlight of our own has the photographic power of sunlight, and the colours are exactly the same as if they were seen in the full blaze of the sun. Of course, if people want to be taken under different circumstances, 'in the dusk with the light behind them,' or in the glow of the firelight—well, we can arrange our lighting effects to that end. As yet, however, the 'atmosphere' of landscape remains the painter's monopoly.

"Given our sitter, we can deliver the coloured plate in a few minutes, and can print off as many copies as are wanted in

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about three weeks. We have already had orders by the thousand.'

"Among the celebrities who have already sat for their colour photographs are Prince Alexander of Teck, the Gaekwar and Maharanee of Baroda, Mme. Réjane, Lord Esher, Mme. Pavlova, and Sir Joseph Lyons."

Piercing Troubles: and the "Miller."

THE subject of "piercing zincos" hasbeen engaging some attention in the columns of our weekly contemporary *The Newspaper Owner*; and in its issue of August 5th we find this letter to the editor, written from Bouverie Street by the Canadian-American Machinery Co. Ltd.:—

"We notice in your issue of July 22nd under 'Mechanical and Method Notes,' a paragraph dealing with badly pierced zincos. This is a very common occurrence owing to the rule-of-thumb methods obtaining not only in most blockmaking but pre-eminently in all composing rooms in spite of there being approved mechanical and accurate methods of dealing with such propositions.

"Our 'Miller' saw and trimmer will pierce and square all ways a block or plate without the use of any extraneous devices, this being only one of its many useful and rapid operations. Over 1500 have been installed in printing offices in the States, and printers here are beginning to appreciate that there is a machine which will enable them to trim, square, outside or inside mortise, pierce, bevel or rout a block or plate dead true and to point measurement in their own composing rooms without reverting to the blockmaker or the foundry."

This is the machine regarding which its makers, for once in a way, imitating Silas Wegg, "dropped into poetry." Those who scanned our back page in our last February issue may recall the Canadian-American Machinery Company's pseudo-Shakespearian philosophising that

The MILLER in quick time plays many parts,
Its acts being seven stages. First, squaring saw
Lowered or raised, by a "third horse" swift
driven.
And then the wily trimmers, their three blades,
With shining face, so slyly creeping up
Most willingly to scoot along the mount,
"Trueing" precise to point, or half a point,
So nice the easy gauge.
And then the lover
Of mitreing swings the gauge, and lo! a cut
Aslant and fair as any maiden's eyebrows.
And then the Beveller, to aid affix
Plates to the mount. Like to a soldier next
The Router comes. The head swung round for
him;
The blade insetted quick, and motion then
Full of strange oaths in tongue mechanical—
A Radial rout, or Straight, or Circled e'en,
Jealous to gain the bubble reputation
E'en from the pressman's mouth.
And then full justice
The comp. obtains. For Mortising is done,
Right-angled notches, true to point each depth,
Filled with point matter, ready comped the
while
(Type strong, severe, with beard of formal
cut).
The next stage shifts into a plane or drill.
And all so nicely fitted are its parts
That spanners, "tommies," or like tools need
ne'er
Be used to make adjustment. For the hand
Suffices for each change.
Full of strange "saws"
And modern instances the MILLER is,
Playing its various parts. And youthful still
It shows: its powers well saved;
(tho' the slight noise
It makes may but a childish treble seem)
And many a year must pass ere it shall be
Sans teeth, sans blades, sans dials, sans
everything.

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What some Successful Men think of Illustration.

HERE are a few opinions from a symposium as to "The Value of Illustration," collected by Mr. Carl Hentschel and worth considering and reconsidering in these quiet months.

Mr. Wareham Smith, advertising manager of the *Daily Mail*, writes:—"A good photographic reproduction I consider is infinitely more telling than the best line drawing, and so long as the block is decently printed it should, I think, be used in preference to any other kind of picture."

Mr. William H. Lever writes:—"Most advertisers, I imagine, would find that to advertise without illustrations would be like the play of *Hamlet* with Hamlet left out."

Mr. Rudolph Hagen, of Cadbury's, gives the urging that the best way to attract is by a well-drawn illustration of a good idea. Mere type cannot have the same force. And Mr. Hagen says the artists who can provide these "well-drawn illustrations" are to be had for reasonable money.

"My experience as an artist, a process engraver, and as an advertising manager, has perhaps given me a somewhat wider knowledge of the question than is possessed by the average man, and I am firmly convinced that plain type can never have the same attractiveness nor the same selling force that is possessed by type supported and assisted by a good strong drawing. Commercial art has made such rapid strides in recent years, and has been so ably supported by the skill and ingenuity of the modern process engraver, that every advertiser who takes the trouble to seek for it (and who will pay the price) can obtain good, strong, original designs with which to illustrate his advertisements. Some of our best black-and-white artists are now devoting at least part of their time to designs for advertisements, and I venture to say that the editor of even the best illustrated weekly has not more artistic brains and talent at his command than are at the service of the merchant or manufacturer who advertises in the public press.

"I should like to say one word of warning to advertisers. Do not allow the question of price to control the purchase of your drawings and blocks. Advertising space is very costly. It is surely poor policy to pay a high price for blank space and then refuse to pay a reasonable price for the design upon which the success of the advertisement will probably depend. After many years of experience I feel compelled to say that inferior drawings and inferior blocks are dear at any price—that really good drawings and really good blocks are cheap at the price for which they can be obtained to-day." Mr. Hagen, it should be noted, is President of the Advertising Managers' Association of Great Britain and Ireland.

Mr. A. W. Belville, the advertising manager of Messrs. Hampton & Son Ltd., says:—"Bad illustrations are worse than no illustrations at all; good illustrations must necessarily add to the value of advertisements."

Mr. Thomas Beecham writes compendiously as to whether illustration helps advertisements: "It depends on the illustration used."

From *The Times*, over the signature of Mr. J. Murray Allison, comes a thoughtful and weighty letter. The public will have

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noted *The Times'* adoption of illustration in its own pages as a striking newspaper event of 1910. Mr. Hentschel draws special attention to the warning here embodied against being content with illustration "badly drawn or badly engraved, or both."

Mr. Murray Allison writes:—"With respect to advertising by means of catalogues, circulars, etc., I consider that the pictorial portion is even more important than the letterpress. A picture will enable a reader to visualise an article immediately without trouble, whereas reams of letterpress may fail to accomplish this end.

"With regard to advertising in the press, I think that in nine case out of ten the illustration helps the advertisement. For instance, I think that all advertisements for departmental stores are stronger when illustrated. Some advertisements, of course, do not need illustrations, simply because the articles which they are designed to sell do not represent individual features. I have always found, for instance, that an illustration of a loaf of bread in an advertisement designed to sell bread is a waste of space, simply because all loaves of bread look very much alike. These are the exceptional cases, however.

"Perhaps it might be as well to add that I think if advertisements are illustrated they should be illustrated well. Some illustrations actually damage an advertisement because they are either badly drawn or badly engraved, or both.

"I think, however, the question is very eloquently answered by advertisers themselves. Every day there seems to be an improvement both in the excellence of drawings and photographs, and the quality of line and half-tone blocks. I believe the day is not far distant when merchants will illustrate their goods not only by fine half-tone and line blocks, but in their actual colours by the three-colour process. It will be expensive, but I believe it will pay."

Three-colour Effects from Two Printings.

Two printings from coloured inks are becoming increasingly popular, though many of these printings only give a suitable colour result, without any attempt to give the effect of more colours than two. But "Kinemacolor" has shown (says the *British Journal of Photography*) that it is possible to get astonishing simulation of most colours from two instead of three exposures, and blockmakers have occasionally done something in the same direction. In this connection there appeared in the Colour Supplement of that journal recently an article by Mr. Colin Bennet respecting the filters that had been found best for "Kinemacolor," and it is probable that this information would be most useful to the photo-engraver who desired to make a speciality of multicolour work in two printings, though, as the author is careful to point out, it is an impossibility to give natural colour rendering in two colours, and all such systems must be colour blind to some portions of the spectrum. The portions that he makes his filters blind to are those colours that are most seldom met with, at all events in ordinary natural scenes.

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The Value of the Silhouette.

PHOTO-ENGRAVERS should use their influence to have their customers make more use of silhouetted half-tones and discourage the use of vignetted plates. Thus *The American Printer*, which proceeds: "There are two reasons for making this suggestion, the principal one being the difficulty and expense caused by the average vignetted plate. A half-tone with fading edges, to be satisfactory, must be etched in a manner better than three-fourths of such plates are now prepared by photo-engravers. No one will deny the beauty of the fading edge when properly printed, but the majority of printers will attest the fact that few vignetted plates are properly printed. This is sometimes due to the plates, but more often to the fact that the half-tones are mounted on wooden blocks, into which the plate sinks after some usage. Even if this difficulty is overcome by the substitution of iron or other metal bases, swollen rollers or poorly coated paper may still prevent the proper printed results.

"The second reason for favouring the silhouetted plate over the vignetted one is that an article of merchandise, whether used in a catalogue or a magazine advertisement, stands out sharp and clean when the background is cut away. A good silhouetted half-tone has all the merits of a good wood-engraving and has a softness that the wood-engraver cannot or seldom does give."

Pure Blacks and Whites through Work on Negatives.

AN invention by Mr. J. Bell relates, says the *British and Colonial Printer*, to the production of pure blacks and pure whites and gradations thereof, in process engraving and like prints from etched relief blocks, by operating upon the film of a half-tone or line negative, or alternatively upon the resist film of the plate to be etched by drawing or engraving either with an artist's or an engraver's tool. In combination with these methods, the whites may be introduced by drawing upon the half-tone screen negative with a fine brush and waterproof indian ink. Suitable tools specially applicable for the process are described. By removing lines or parts of the films on the negative the sensitive film on the printing plate to be etched will be exposed and hardened, protecting such parts when the plate is etched. This means will be adopted to produce blacks. By removing lines or parts of the resist film the parts of the plates exposed will be etched. This method is used for obtaining the whites. The alternative method for producing whites is to retouch the negative with opaque ink. The process is applicable for producing engraved door plates, glass facias, intaglios, and the like. An artist's tool *c*, figs. 1 and 4, for use in forming horizontal and inclined lines, has its acting edge below the centre line of the stem and curved to enable graduated lines to be formed by slightly rotating the tool in

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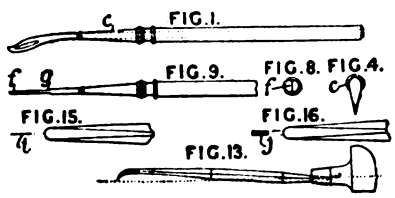
forming the lines, or by varying the angle at which the acting edge of the tool makes



contact with the surface. A second artist's tool for use in producing perpendicular lines has an acting edge (*f*, fig. 8) which is semicircular in shape and when used for ruling may have square shoulders (*g*, fig. 9). An engraver's tool for the process is constructed as shown in fig. 13, so that the acting edge is at right angles to the direction of movement of the tool and is above the central line of the stem. Fig. 15 shows an enlarged end view of the head to produce a line *i*. The end may, however, be flattened to produce a thicker (*j*, fig. 16).

Baryta Prospects for Photographers: An 8d. Substitute for 1s. 8d. Paper.

THERE was a meeting at 5 Moorgate Street on July 28th, of which the record must interest photographers who are on the look-out for developments in their business profession. Substantially it comes to this, that the makers of the old photographic papers are to have a bold rival. But we will let Mr. Hartley Aspden speak as to this, only premising that this gentleman has for long been known to the press world as editor of one or more of the numerous papers issuing under the Harmsworth ægis—a Sunday paper particularly being in his province.

Mr. Hartley Aspden said the meeting was called to comply with an Act of Parliament which stipulated that a meeting of shareholders must be held within three months of the date on which a company was entitled to commence business. The capital of Baryta, Ltd., was £150,000, in shares of £1 each. Of these shares, 111,000 had been subscribed for in cash, 86,000 being paid up to the extent of £1 per share and 25,000 to the extent of 5s. per share at the date of the report. The remaining 15s. per share was payable in instalments up to December 23rd, by which time the whole of the present issued capital would be fully paid up, and the company would have had subscribed a cash working capital of £25,000, while a further 25,000 working capital shares were held in reserve for future issue. This company was formed for acquiring and working certain patents for the cheaper production of photographic paper and manufacture and sale in this and other countries.

There were enormous possibilities. At present photographic raw paper was not made in this country at all. It was the profitable monopoly of a few Continental firms, countable on the fingers of one hand. They had produced the chemically pure paper deemed to be necessary for the P.O.P. and collodro-chloride emulsions, and this raw paper was sold at an average of 1s. 8d. per lb. No English firm up to the present had been able to produce this pure paper for these purposes. This purity of production was necessary because, after sale to manufacturers of

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photographic materials, they superimposed a delicate sensitive emulsion, and if the soluble salts they employed came into contact with any metallic particles in the paper the result was shown in disfiguring specks and blotches on the photograph. The greatest photographic firm in this country and America was reported to keep regularly in stock nearly 4000 miles of this paper, every metre of which, for the kinds of paper just mentioned, had to be obtained from this limited source.

Baryta Ltd. did not pretend to have acquired this secret process of making chemically pure paper; but they acquired a process which no longer made chemically pure paper indispensable for photographic purposes. They believed that they had in the patents of this company a process of making ordinary paper available for photographic work at a cost of about 8d. per lb. as compared with the 1s. 8d. per lb. which the Continental firms charged for the same quality of raw paper. They proposed to take ordinary raw paper, which any papermaker could manufacture, and make it suitable for coating with emulsions of the most delicate nature. The paper so treated might be full of metallic particles, as all ordinary paper was, but the soluble sensitive salts could not reach them, through the patent protective layer.

Mr. York Schwartz, one of the greatest experts in the chemistry of photography in this country to-day, and also one of the leading Continental experts in baryta-coating and paper-making, and another gentleman, were bound by agreement to give the company their services and inventions, and to offer any further inventions at the minimum price they would be willing to accept from other parties. They intended certainly to prepare this raw paper for the market, but to coat it with a baryta layer, as was done by the Continental firms. Baryta-coating was the protective enamel-like surface on which the delicate emulsions for P.O.P., bromide, etc., were superimposed.

They would at the earliest possible moment install near London a complete baryta-coating plant, with separate departments for emulsifying the paper so produced, in order to supply the complete article.

They had already been approached by prominent Continental photographic paper manufacturers for the acquisition of some of these foreign patents, on terms which the directors considered entirely favourable to this company. They had got to remember that photography had by no means reached its zenith. They were introducing a new industry into this country. In a few months they hoped to have a fully-equipped factory for the coating with baryta of raw paper for the trade, and also to coat paper with sensitive emulsions themselves, more particularly the phosphate of silver emulsions, believing that a phosphate of silver emulsion paper properly placed on the market would be a profitable source of income to this company.

Answering a question the chairman said the company had received a very excellent offer for one of their patents for the manufacture—in one country only—of their paper. The company were not disposed, however, to sell their patents outright, but they were prepared to dispose of them to any foreign photographic paper manufacturer on terms to be agreed upon, and subject in every case to the payment of a royalty. They anticipated no difficulty in disposing of some of their foreign patents in that very profitable way.

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After the Holidays: A Straight Talk.

By the Editor.

"WHAT a glorious summer. I'm glad I'm alive. I wish you were."

It was a Fleet Street interchange. It was rude. Fleet Street has a way of being rude—to Fleet Street. It didn't matter, as the man who was addressed, or, in colloquial phrase, was "got at," could always give quite as good as he received.

I lead off with this badinage because it suggests a thought which, I hope, is not frivolous, but sound and sane and wholesome for these times; rather particularly wholesome for the engraving world; the thought of a full life, as, after all, what we all need.

The new head of Linotype and Machinery Ltd. was lately addressing undergraduates at Cambridge upon science in relation to business-life; and so doing he quoted and endorsed with emphasis the saying that the great need of the average man is not to make a livelihood, but to make a life. Of which need we may perhaps be most conscious when just returned from sea-swimming or yachting or motoring or foreign tours, having drunk deeply awhile of refreshing pleasure.

Holidays are silver linings to clouds. Why are we satisfied to have commonly so much cloud and so little lining? so stupidly satisfied with an existence dull, drab, and dolorous?

I was speaking lately to a process engraver whom the business world would probably call successful as things go. I found, and was glad to find, that he was not so easily satisfied; he *was* one of the "want-ers." "Considering the cost of all my education, general and technical, and considering the capital I've risked, I don't consider I've anything to congratulate myself upon in being head of this process engraver's business. The profit is not nearly what one might reasonably have hoped for."

I remembered the 6s. per square inch which was being paid for the set of three-colour blocks when I first had business touch with three-colour fifteen years ago, and I compared with it a wretched 1s. 9d. for the same three colours. He might well enter his lament. I knew too that it was not a selfish lament. For instance, he had invited me to suggest to him anything it might be practicable for him as managing director to set on foot for the good of the youngest workers in his business, apprentices or others. I could indeed wish that so large-hearted and altogether broad-minded a man as I knew him to be were making his pile. He would do good with it, for others as well as for himself.

Well, he wants to succeed, and not for himself alone. He wants a life as well as a livelihood. That's something to the good. He *wants* to. And therefore he will. There are engravers who apparently don't want to succeed—and who therefore won't: it is they who "make me tired."

I put it to the craft, to extend their holiday; to carry its largeness, its freedom, its freshness, its zest, its horizon, into their resumed business; to be masters of their business, not slaves. To live—it's all in that word, to live. "Live in the constant realisation of the whole sweep of your existence."

Holidays help towards this, and all our fragments of well-spent leisure through the year also help. By that I mean much more than that they take us away from business and give us something different to think of, and send us back changed men. The ideal holiday, the ideal leisure, takes us *to* our business, and presents it very vividly to us as urgently wanting and worthy of our largest and best thought. The ideal holiday does not simply send us back as changed men to the same business; it sends us back to *business which has changed its character.*

We go away tired and very indifferently successful from a business (in this case plate-making) which has been a sort of huckstering, a hit-and-miss, a happy-go-lucky pitch-and-toss, pettifogging buying and selling. We go away; and as this our business comes to mind ever and again during our pleasuring, we begin to see it changing its aspect. We see it better for our distance from it, just like the man who could not see the forest for the trees till he had left the forest some way behind. We begin to see that our business rightly considered is no such mere petty huckstering, but is our service in the scheme and economy of things; we begin to see that business is system, science, and statesmanship. We begin to see that as business men we touch life at a thousand points. We begin to see that business gives us an opportunity which is as big as we are.

. . . . . .

And let me say here, that the men who really count as business forces are, generally speaking,

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the men who dare, month in, month out, to give vent to something within them which is not the mere "gathering of gear." David Harris, whose firm produced our first English book on three-colour half-tone, did yeoman work in leisure among boys' brigades in Edinburgh—and raised Fleming ink-making profits to be as big as their turnover was when he was "assumed" as partner. A doctor of science at Jena has exhibited at once the finest organisation, the most human, not to say large-hearted, relationship and mutual co-operation of factory workers I have ever heard of, the world-famous Zeiss-Bund—and also made lenses which I think, I may say, are nowhere in the world surpassed. Sir Charles Reed in his day presided over the old London School Board and entered Parliament—and made Reed type famous through printerdom. Caslon, over a century before, had his regular musical parties with Handel an occasional guest — and in type-founding was the same masterful conqueror that Wedgwood was in pottery. Wedgwood's name only occurred to me as a craft comparison; but I can make full use of the reminder, for Wedgwood was one of the intellectuals of his town. Faraday, again, who discovered for us that proportional law in electrolysis on which all duplicate platemaking depends, was a loyal and humble-minded member of a particularly fraternal and mutually helpful religious community, the Glassites, or Sandemanians.

Some of the best contributions this journal has had this year, written by a man exceptionally successful and with very large responsibilities, have come from a member of the same Glassite community. Mr. H. K. Stephenson has, I believe, been Rector of Sheffield University College—and the typefounding eminence of his firm we all know. Edward Baines was a notable political and sociological worker—and never was the *Leeds Mercury* such a power as in his time. The Spicers are about the best known men among papermakers or merchants for municipal or social service—and about the most prosperous in their business. Sidney Waterlow worked in housing reform, and gave London its prettiest park—and was a remarkably successful printer. Mr. Walter Hazell has promoted certain emigration schemes and has served in Parliament for Leicester and done varied public work, and runs a dairy farm, I believe—and as Chairman of Directors he seems to find his printery regularly paying a two-figure dividend. Mr. George Hart is conspicuously outstanding among printing managers for his devotion to continuation schooling and other educational uplift for the boys of printerdom, and has made a printer's office not only a fine dividend-yielder but quite a place of pilgrimage for American and Continental printers wishing to glean valuable business pointers. Dr. Spottiswoode was President of the Royal Society, and wrote on light polarisation and scientific topics galore—and Eyre & Spottiswoode, I believe, never did better than when he was its head. Theo. de Vinne has always had the time and the leisure for a large solicitude for the welfare of the whole craft—and has made the De Vinne press a national pride. Max Levy is by way of being a philosopher—and has won first honours in half-tone screen-making. Mr. W. H. Smith led Parliament—and led news agency. Mr. Carl Hentschel is a first-nighter of first-nighters and a city councillor—and has made the *Inland Printer* of America sigh, "If only the engravers of the world could make colour plates like Carl Hentschel." Mr. William Gamble indulges in writing a pithy and humorous volume on business philosophy—and leads America by a dozen years with his *Process Year Book*, not to speak of his Penrose directorship. A few trade union litho artists give their leisure and their pence to mutual craft improvement, and establish what is now the L.C.C. Bolt Court School—and at the same time, we may be very sure, respectively take leading positions in their "shops." The Quaker John Bellows joins many a social crusade—and makes his Gloucester printing well respected for its sound craftsmanship. Passmore Edwards is famous as a philanthropist, and makes the *Echo* pay; while others succeeding him—do not succeed.

But why extend the list? Surely we are agreed. Schiller gave us a great truth when he said:—

"The narrow circle narrows too the mind,
And man grows greater as his ends are great."

By way of warning against the oppposite trend, let me recall how Queen Victoria once said (as Morley's *Gladstone* reveals), a strange shrewd word to Archbishop Benson.

"The longer I live," she declared, "the more I am struck by the littlenesses that occupy many people's minds; the little interests, even the little spites. It does seem to me at times that they are all a little mad." Well it might so seem. Among those who are a little mad are the people who dare little in the way of holiday or leisure, and who care little how fares the world. These people have commonly little success in business.

I happened to pick up Edmund Burke in an interruption after starting. It is a peculiar mark

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of that gifted man that he, more than any other notable figure in our history, is consulted by members of all parties. Gladstone and Lord Beaconsfield each on occasion could reinforce an argument or adapt some striking imagery from Burke. I like, and I find appositeness in, a number of things I read in Burke; as, for instance, when he speaks of the mistakes of a man who, "with no small study of detail," "did not seem to have his view carried to the whole circuit of affairs." When I am appealing for a view of the *cui bono* of the daily toil, and of the need to reconsider things and relations fundamentally, in view of the poor reward, I can appreciate this warning that common pursuits may not qualify for an uncommon time. Men "too much conversant in office are rarely minds of remarkable enlargement." What with "the limited and fixed methods and forms established there" they are "apt to think the substance of business not to be much more important than the forms in which it is conducted." "These persons do admirably well as long as things go on in their common order, but when the high-roads are broken up and the waters out, when a new and troubled scene is opened and the file affords no precedent"—when prices are ridiculous, in fact—"then a far more extensive comprehension of things is requisite." He speaks of the mischief "of not having large and liberal ideas in the management of great affairs." It may be said that Burke, when entering this caution, was thinking of an epochal trouble, that, in fact, which led to the loss of the American Colonies. Yet do not the words embody a universal truth? and after all, is not the making of our own life a "great affair" for us?

FRANK COLEBROOK.

A Substitute for Transfer Paper.

FOR the different kinds of transfers which are used for engravings and similar graphic work the so-called "drawing" or "transfer" gelatine may be used with advantage. In the preparation of transfer gelatine only the best animal glue is used. and it is sold in perfectly transparent sheets, which can be obtained in different thicknesses. The most suitable for the engraver's purpose is the "medium," as it is more flexible and not so apt to be cut through when scratched with a needle.

The advantage of the gelatine transfer lies in the great exactitude which may be obtained, as the pattern can be exactly copied to the minutest line owing to the glass-like transparency of the gelatine, and thus requires no after-drawing, each line being copied through, as with transfer paper; but the gelatine etching is rubbed with red or blue-coloured powder, and by a slight rubbing on the back this is transferred directly on to the engraving material.

The copy then stands out sharp and clean in the colour of the rubbed-in powder on the material to be engraved, and to guard against smearing or rubbing off, and to fix it firmly, the surface of the plate should be slightly damped by well breathing on it. By this plan, the copy in the coloured powder is held fast and cannot be rubbed off.

Before commencing to etch, the gelatine is to be perfectly cleaned from any dirt which may adhere to it, by using a piece of wadding and some turpentine or benzine. Then a piece must be cut from the sheet with the shears somewhat larger than the copy, and this is stretched out and fastened down flat with drawing pins at the upper side. Then the etching or scratching with the etching needle can be begun.

As gelatine is sensitive to warmth and damp, it must be protected from the mouth, and breathing through the nose must be cultivated, and a piece of paper should be placed under the right hand to avoid resting the palm upon it.

It may be mentioned that the etching needle has a polished point of rounded form; this sharp point must be rubbed on the oilstone till it is somewhat blunted. The needle should scratch the gelatine pleasantly and without trouble in all places, and leave a shaving behind it as an evidence that the lines are sufficiently etched and not pressed in, for in such a case the colour powder will not be held fast. In this way an exact transcript of the copy lying beneath the gelatine can be traced. The work succeeds at the first trial if the etching needle cuts well.

As soon as the etched transfer is ready, it is dusted over carefully with a large brush; then the colour, which must be the most perfectly ground grit-free powder that can be obtained, must be rubbed over the etching with a piece of clean ungummed wadding. This colour powder easily accommodates itself to the lines, and the superfluous colour powder is then rubbed off

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with a fresh piece of wadding. Then the transfer is turned over and laid upon the surface to which it is to be transferred and the back rubbed with a medium lead pencil or leather stump, and sufficient pressure to ensure each line being placed sharp and clean on the surface of the plate. For large gelatine transfers they may be placed on the plate and drawn once through the machine with a moderately strong pressure. When the transferring has been successful, one breathes upon it as mentioned at the outset, and after this the engraving can be gone on with in the usual way.

It has been observed that the gelatine transfer can be used many times for the same purpose. In such a case it must be dusted afresh every time of using with powder, and it must be borne in mind not to press too heavily on the lead pencil or leather stump, or the lines of the etching may be closed or pressed together.

With some practice the most complicated copy can be traced upon gelatine perfectly free from faults. According to the manner of holding the needle the lines can be rendered either fine or coarse, and the effects can be thus controlled. Now and again a small piece of black card should be pushed between the gelatine and the copy, as then the etched lines will show up white and clear on the black ground, while the lines that are only pressed will not be visible. The gelatine transfer is superior and easy for any work where an exact transcript of the copy is required, as the ordinary transfer on paper gives no certainty of exactitude.—Translated from *Deutsche Grav. und Stempel-Zeitung*, for the *British and Colonial Printer*.

Index of Current Literature.

The British Journal of Photography in its Photomechanical Notes for July simply gives brief descriptions of recent process patents, with comments.

Zeitschrift für Reproductionstechnik for July has articles on "Reflections from Originals," on "Amphitype," "Intensification and Reduction," "Dry Plates for Reproduction Purposes," "Metal Printing of Dry Plates," and on "Transfers for Relief Etching."

A PACKING HINT.—The usual method of packing blocks for post is to break a piece of millboard or strawboard of the correct size, place this on the face of the block, and wrap in brown paper. Where a large postal business is done, however, it is better (says *The British Journal of Photography*) to have cardboard boxes made that just take a block. Of course, this means having a large series of different sizes made, and necessitates a certain amount of room to have the boxes suitably disposed, so that they may be come at quickly in the size required. If this space is available, then this method is by far the most satisfactory, and even cheaper than others, since the boxes are very inexpensive; the blocks need no packing, but are merely placed inside. No wrapping is needed, for the box is simply tied round with string and the address put on the box itself.

The *Inland Printer* for August deals with the soldering of electros on to solid metal; and with hard stereos. It says the Lovejoy Co. of New York bought rights to make Dalziel stereo plates, but after some time discovered it cost more to make them than to make electrotypes. The same number deals with the casting of chalk plates and with concaved stereotypes, and how to avoid them.

In another part of the journal Mr. S. H. Horgan supplies a full report of the photo-engravers' fifteenth annual convention at Cincinnati, "the most valuable boost the photo-engraving business ever received. . . . It was around the question of costs that the most attention centred." In his usual notes Mr. Horgan deals with a new etching machine for copper only, invented by Geo. H. Benedict of Chicago. He moves the solution up and down. A travelling "weir," a section like an inverted "V," makes the solution rise to the face of the plate and run over the back of it. It moves four to five times a minute. Mr. Horgan treats of "vignetting round and elliptical half-tones" and of "uneven flat etching."

The *American Printer* (August) records how the Bush-Krebs Engraving Co., Lousville, Ky., installed the Denham cost system. Shortly after it was installed they found that of 200 orders 112 showed losses and 88 showed gains. Recently, out of the same number 86 showed losses and 114 gains. The records also bring out the surprisingly high cost of line in small sizes. The *American Printer* devotes very much more space to British affairs than any other American journal, and it has quite a lot to say about how British illustrated papers coped with the Coronation occasion.

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Some Pointers worth Pondering.

SMALL problems are herewith proposed for engravers lazying awhile in the warm weather—as to just how far they agree with these counsels of the *American Printer*:—

"It is advisable for day workers who constantly face the light from a window to use an eye shade. Quality and quantity of press work are considerably affected by the sort of light afforded. A press (a printing machine, that is) should not be erected with the rear end to the window. The light should strike the right side of the press-feeder side of the cylinder press and the feed-board of the side of the platen press—so that the maximum number of vital spots may receive good light.

"If choice is permitted, a half-tone with not too fine a screen for bond paper should be used. But regardless of screen good results are quickly obtained. Use a bond ink, stiff, dense, and almost blue-black, one sheet of pressboard and two or three sheets of book paper, two of which may be thrown out after overlays are placed in position. Cover this packing with a sheet of manilla tympan. Pull an impression on the bond paper and make ready so that all the forme prints well and the impression of the half-tone is level. Then pull an impression of the half-tone on bond paper, cut out high-lights, skive away any vignette edges, and accurately paste this simple overlay in position. Now place the pressboard between overlay and tympan and you have secured the best print possible in this work, no matter how much time you might put in on the cut.

"Coloured inks should be mixed in daylight only. The most experienced have trouble under artificial light, which considerably changes the appearance of coloured inks. A great help to quick, accurate colour-mixing is found in using a plate of the best French glass as a slab and by placing a sheet of glossy white paper beneath the glass. This clearly shows the colours as they will appear when printed on white paper. If the inks are to be printed on coloured stock, after securing mixtures desired, withdraw the white paper and in its stead place a sheet of coloured stock to be used. These little wrinkles will be found time and trouble savers.

"Very few jobs printed on a platen press need to be slip-sheeted if the sheets are laid out on the delivery table in shingle or dovetail fashion. Not only does this arrangement minimise offset by keeping pressure in a few spots, but by allowing access of the air to the sheets it hastens drying. It is necessary to slip-sheet large sheets of half-tone work and also large sheets of ledger paper, so large that they can scarcely dovetail at all. Besides, the ink sets slowly on this very hard paper.

"By floating benzine over a sheet of thick ledger or bond paper you make it transparent for the moment, when you can lay the sheet over the impression on the tympan and set the gauges accurately. This is the quickest way to set gauges when using large sheets of thick paper which are not easy to fold quickly and accurately. Besides, the sheet of ledger is not spoiled by the benzine as it is by creasing, a point to consider if the stock has been lithographed.

"Oil of spike-lavender, not to be confounded with the very dissimilar oil of lavender, which it resembles in odour only, is a favourite reducer of linseed oil paints as used by artists. Besides being quite as effective as spirits of petroleum or turpentine, the spike oil has the pleasant lavender odour so generally esteemed. Oil of spike is suggested as a reducer of foul-smelling inks, as it effectually overcomes other odours."

My Causerie.

TREAT yourself well for once in a way. Buy one of the 250 available copies of *Frederick Goulding: Master Printer of Copper Plates.* It costs a guinea; you cannot get for a guinea a physical holiday to last a fortnight. Why, then, grudge a guinea for a mental and spiritual holiday to last your life? That is what it amounts to. A book like this gives one that which is of the essence of a holiday.

For it gives us a change. We are introduced into a new order of things; we move under the influence of unfamiliar ideas; we feel ourselves judged and that we also are judging by a new standard of values. We rise from the reading feeling that we have tasted what H. G. Wells would call the "food of the gods"; and that as the consequence we have "grown."

Yet Goulding was not a man who himself filled a large place as conventional reckonings are made, though, to be sure, he was from 1890 onwards Master Printer to the Royal Society of Painter Etchers. What led to this apppintment was the repute won by his work during the eighties. In the Shepherd's Bush Road he had established himself as an engraver who would render in the engraving world the same kind of service and bear the same kind of witness which in printing was to be rendered and borne by William

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Morris. His studio was called Kingston House. The triumphs of Kingston House in the eighties led, by a kind of inevitability, to the distinction named which he received in 1890.

Mr. Martin Hardie, the author of the work, tells us how whole-heartedly Goulding devoted himself to his hand-printing of hand-engraved copper plates. Though about fifty years following his apprenticeship in 1857 to Day & Son of Gate Street, W.C., he confined himself almost entirely to the inking and printing of copper plates. He taught an etching class at South Kensington, and that was some kind of relief variant upon his staple labours.

He never seems to have found his work pall upon him. He was the devoted, loyal, and undoubtedly the most able helper of James M'Neill Whistler, of Legros, of Sir Francis Seymour Haden, and "of nearly every engraver or etcher of repute during the last four or five decades." The fortune of the plate largely depended upon the way this artist of a printer could make the plate paint its subject; could make it express all the contrasts and harmonies of the engraver's intention. A very large portion of the artists' proofs, proofs before letters, and other prints of the best subjects seen in print-sellers' windows, came from his press; and a great many of these came from his own hands.

Of course this book is finely produced; on British-made deckle-edged paper, with good margins, and with some with full illustrations. Eneas Mackay is the publisher.

Some time since I called attention to the possibilities of nickel as a substitute for paper in printing. *Nash's Magazine* presents us with some of Mr. Thomas A. Edison's ideas on the subject. He says:—"Nickel will absorb printer's ink. A sheet of nickel one twenty-thousandth of an inch thick is cheaper, tougher, and more flexible than an ordinary sheet of book-paper. A nickel book, two inches thick, would contain 40,000 pages. Such a book would weigh only a pound. I can make a pound of nickel sheets for five shillings."

"Nash's" man had understood Edison to say that he was already making, for another purpose, the thin nickel sheets of which he spoke. That seemed to bring the nickel book close within the range of present possibilities. Then it occurred to him that perhaps Edison had mastered only the problem of manufacturing in small lots. So he said:—

"Suppose you were to receive from a publisher an order for a sheet of nickel seven feet wide and a thousand feet long—could you fill it?"

"I could fill an order for a sheet of nickel seven feet wide and a mile long," Edison replied.

Then he told how he made nickel sheets so thin. It is entirely an electrical process, accurate to a high degree. An electric current in operation for half a minute deposits on a prepared base one twenty-thousandth of an inch of nickel; never more, never less. "An absolute law governs this," said Edison.

It was Faraday who gave such a lift to the printing world by his discovery of the laws that the amount deposited electrolytically was precisely proportionate to the current employed under given conditions. Where would the electrotyper be if he could not depend upon the so-called Faraday's law?

That mellow philosopher the editor of *Process Work* is surely letting himself in for something in this silly season, as this clipping from his August issue will explain:—

"We congratulate Mr. W. C. Simmonds, who runs the process department of the *Jersey Morning News*, on his marriage with Miss Mabel Hodge, of Plymouth, which was celebrated on July 19th. Mr. Simmonds is well known in the process trade in London, and before going to Jersey was on the *Oxford Times*. He has also held an important position in India. Evidently Mr. Simmonds does not agree with those who think a process-worker, especially a newspaper hand, should never marry. *We should like some of our readers to write us their views on this latter rather extraordinary dictum*, which we were rather surprised to hear put forward recently by a prominent newspaper man." Italics ours; but the correspondence may be his. F. COLEBROOK.

School Notes.

MR. A. J. NEWTON, Principal of the L.C.C. School of Photo-Engraving and Lithography, and of the St. Bride Foundation Printing School, has been appointed by the Board of Trade as one of the honorary jurors to represent Great Britain on the International Jury at the Turin Exhibition.

THE L.C.C. School of Photo-Engraving and Lithography re-opens for the 17th session on 18th September 1911. The items in the prospectus are practically the same as before, with the exception that special courses of lectures will be given throughout the session, dealing with the whole of the photomechanical processes. The elementary course will be given on Thursday evenings, and the advanced course on Tuesday evenings.

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Estab. Jan. 1894.
"The Process Photogram."

THE PROCESS ENGRAVER'S MONTHLY
THE PROCESS PHOTOGRAM ESTABLISHED JAN 1894

Vol. XVIII. No. 214.
OCTOBER 1911.

AND ELECTROTYPER'S AND STEREOTYPER'S REVIEW

Some Autumn Happenings.

PERHAPS the announcement in a London financial paper that Messrs. Wratten & Wainwright are establishing a factory at Buda-Pesth is one of the most interesting autumn incidents, and, considered broadly, is one of the most gratifying.

This step has been taken as a consequence of representations made to the firm some time ago by the Buda-Pesth Bank Ltd., a firm which is interested in the business of the First Hungarian Photographic Factory at present manufacturing dry plates in Buda-Pesth. As a result of negotiations between Messrs. Wratten and the Buda-Pesth Bank Ltd., a new company has been formed with a capital of £16,500, the directors including representatives of the Hungarian Photographic Societies, Directors of the Buda-Pesth Bank Ltd., Mr. S. H. Wratten, Dr. C. E. Kenneth Mees, and Mr. Leo Weiss, of the First Bohemian Glass Co.

Messrs. Wratten & Wainwright will be entirely responsible for the technical direction of the business. Mr. S. H. Wratten has been busy in Buda-Pesth superintending the erection of a new factory, where it is Messrs. Wratten's intention to manufacture plates to supply the customary general demand. They will not manufacture panchromatic plates in Buda-Pesth for the present, but the Buda-Pesth company will act as their agents in Austria-Hungary and Germany for the British-made products. It is hoped within the next few months that the new factory will be in full working order, and that the present staff will remain under the direction of Mr. S. H. Wratten and Dr. C. E. K. Mees.

The whole craft, which owes so much to this firm, will rejoice in this sign of its strength, and will greet its new development with heartiest well-wishing.

Mr. Saalburg in New York continues to put out strong colour work. It will be interesting to have the doubt cleared up as to whether the key only is by intaglio methods, the colour being by litho and possibly by offset. The new Bendixon and Widdop patent for combining intaglio and litho marks an important development in connection with the Rembrandt Company's work. Clearly a great popular advance is likely to be recorded in this art-printing method, if the offset press, with its facility for transferring and correct registering and rapid output, can be satisfactorily pressed into service. All who know anything of the actual working of rotary intaglio know that although very beautiful intaglio work in colour has been produced it has not been pressed very hard on the market, suggesting that the actual workers were only too painfully conscious of the difficulties inherent in the

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method if "intaglio" was to be persisted in for all the workings.

Instantaneous photographs in colour are now being taken in the Dover Street studios almost daily, with fine glass transparency results; and collotype reproductions on paper have on the whole scored considerable success. We ought not to lack good workmen to follow up this art. Great Britain is commonly a damp country, it is true, for all the dry summer of 1911. But admitting its ordinary humidity it is not as damp as Amsterdam, which produces some of the finest collotype in the world.

France, Germany, Northcliffe, and Hulton have been having conversations; so it is said. Not all together; and not all about Morocco. The latter two of these four "great powers" have, it is whispered, been discussing and, informally at least, agreeing upon delimitation of spheres of influence. The anti-*Daily Sketch* war may therefore be expected to be less acute. But both *Daily Sketch* and *Daily Mirror* have been doing things during recent weeks.

At the Coronation Exhibition at Shepherd's Bush recently a *Daily Sketch* photographer took a snapshot of the Duke and Duchess of Teck sitting in front of the Garden Club in the Exhibition. The photograph was developed, printed, and a half-tone block made from it with the Penrose working plant which that alert firm was running in the Exhibition. Proofs were taken from the block and given to the Duke and Duchess within twenty-five minutes from the time the photograph was taken. A still more remarkable achievement is that performed by the *Daily Mirror* at the time of the recent visit of the King and Queen to Dublin. Realising the impossibility of the photographs reaching London in time for blocks to be made for next morning's paper, the *Mirror* people installed a complete Penrose plant on board one of the steamers running between Dublin and Holyhead. The photographs were developed and the half-tone blocks made during the passage across, and readers of the *Mirror* were able to see excellent pictures of the previous day's events in the paper laid on their breakfast table next morning. Mr. Hannen Swaffer, the able art-editor of the *Mirror*, is justly entitled to congratulate his colleagues—not forgettin' hissen, as a Yorkshire toast would express it—upon this accomplishment.

Bad News for Printers' Devils.

WHAT! about five thousand printers in a church and before three in the morning? Here is the record in an American journal: "Nearly three thousand men and over two thousand women attended a Pontifical Mass at St. Patrick's Cathedral, New York, at 2.45 a.m. on Sunday. It was the tenth anniversary of the first 'Printers' Mass' ever held in the world, and an occasion that those who had the privilege of attending will never forget—the presence of so many prelates of the Church, the magnificent cathedral thronged to the doors, the gorgeous ceremonial, the great organ and male choruses, and the addresses of the Archbishop of New York and the Bishop of Trenton at that early hour on Sunday morning, when all New York is in its soundest sleep."

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A few Useful Hints to Press Photographers and Process Engravers.

By "St. Mungo."

These few notes are intended for beginners and amateur press photographers; with a few notes, too, for the process engraver who may be single-handed or needs a little advice from one who has gone through the mill.

(*Concluded.*)

WHEN you are coating, the first surplus must be allowed to go into the sink, then pour the glue once more on the opposite corner and "flow" once more, pouring the surplus into a funnel placed in a bottle kept for the purpose. Whirl the plate over the sink and then dry off over the stove. Warm the negative, place the metal on it, screw up in the frame, and print for three to five minutes according to the character of the negative and strength of light.

When sufficiently printed, take out the zinc plate and place in a dish of water, and with a syringe wash out the print gently. Stain with methyl violet.[1]

Complete the washing out, and if the print is satisfactory proceed to harden with a solution of chromic acid very weak by flowing the solution over the plate from two directions. If time is no object, it may be allowed to remain in a hardening bath composed as follows:—

FORMULA FOR HARDENING BATH.—Chromic acid, ½ ounce; methylated spirit, 5 ounces; ammonium bi-chromate, 3 ounces; water, 50 ounces. Mixed in order given.

The time for remaining in the bath should be from half to three minutes according to the amount of use and age of bath. When the above bath is fresh half a minute is ample. The above is an alternative method to flowing with chromic acid. When hardened the print must be rinsed with water for about half a minute and whirled over the stove to dry, and if satisfactory it should be burnt in until the image assumes a golden colour, *not dark brown*.

The back may now be varnished whilst warm with the following:—

FORMULA FOR VARNISH. — Shellac, 4 ounces; methylated spirit, 12 ounces; methyl-violet dye, 1 dram.

When cool, scratch the white lines on border with a sharp strong point, and spot the print, if required, with varnish diluted slightly, and proceed to etch.

THE NEGATIVES.

A word or two with reference to the negatives. If one can ensure getting negatives which will go straight down without rolling I have found that it will save a lot of time. At the same time I would not like to say which gives the better printing block.

Those prints which require rolling I proceed with in the following manner:—I place in etching machine and brush the scum away with soft brush; then etch slightly. After washing and drying I take a rubber or glazed roller and roll out upon an ink slab a little of ordinary letterpress ink at about 1s. per pound.

[1] METHYL-VIOLET DYE.—Methyl violet, 1 ounce; water, 20 ounces. Mix 1 ounce first with the smallest quantity of methylated spirit.

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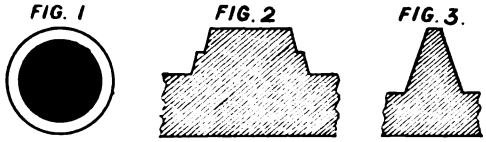
Then roll the plate until the ink is forced down the sides of the dots. When evenly and satisfactorily rolled I dust the plate with powdered resin, which adheres to the tacky ink. After rinsing the surplus resin off under the tap I place the plate into the machine and give another slight etch. After rinsing off the acid I dab the plate with wash leather until the

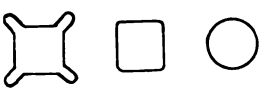
FIG. 1 FIG. 2 FIG. 3.



surface is dry, and wash the ink off with naphtha, using a medium kind of brush. Great care must be taken to see that all the ink is washed out of the etched portions of the plate. When finally it is washed with the spray the appearance of the plate is similar to fig. 1.

The fish-glue portion of the print is represented by the solid black part of the diagram, whilst the outer circle represents the halo-like appearance around the dot where the ink protected the sides of the dot. This must be removed by another slight bath. Fig. 2 represents a section of the dot before the final etch. After the slight final etch the high-light dots will appear pointed and at the same time the halo will have disappeared. A section of the high-light dot will have the appearance of fig. 3. If the foregoing instructions have been carried out successfully we shall have made a friend of the stereotyper and the printer, and at the same time have the pleasure of knowing our part of the work is satisfactory, a thing of beauty and a joy for ever.

The figures herewith should be noted in connection with the first part of "St.



Mungo's" article. It should also be added that the screen distance he adopts as set forth in that article is *f*/11.

Glass Plate versus Glue Plate: Some Curious Ruminations.

By an Old Hand.

1s. 6d. per inch—Blanket work not "a soft thing"—A screw (driver) loose—The "demon acid" and the glass plate—How the glue plate served—"I believe the cutting is needless."

TWENTY-FIVE or thirty years ago the half-tone process in this country was practically in its infancy, and although one or two firms in London were experimenting, and sometimes supplying half-tone blocks to printers, the results, to put it mildly, were somewhat crude and not what we are accustomed to see at the present day, when for illustrative purposes the process block has taken first place to the exclusion of almost all other methods of reproducing half-tone pictures. Several London firms at the period I write of were making excellent line blocks, and Ives in America and Meisenbach in Germany were pioneering half-tone, while the process of the latter was being worked in London, in premises in Farringdon Street, if I remember aright, and the price paid for what then, and for many years afterwards, were known as Meisenbach blocks would

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make the present-day process engravers green with envy. I have known of 1s. 6d. an inch being charged for half-tone work, and 1s. was readily given.

The *Times* for quite a long time (many years, I understand) paid 1s. for its line maps, and that being so, and doubtless being much quoted as a standard, it is very understandable that very good terms were got for a process which purported to give the middle tones and the whites, as well as a fair representation of the full tones. No doubt the *Times* line maps were very beautifully executed. No doubt, too, line work of to-day is frequently very poorly executed; a very great deal of the artist's delicate tracery or stipple effect being altogether lost. That is a relevant and rather rueful reflection in passing; but I must not enlarge upon it now, contenting myself with saying that a quality which the public won't pay for, it will inevitably soon cease to obtain. Or to put it another way, and perhaps more strongly—the things we try to get for nothing are the things which sooner or later will cost us most.

No Ready-made "Make Ready" Men.

One serious drawback in those early days to the popularity of half-tone blocks was the difficulty of finding a machine-minder who could make ready properly. Hard packing on the press was just becoming general. Many houses, however, still stuck to the soft blanket or rubber cloth, and these latter found the half-tone process beyond their powers, the impressions got from the blocks being simply black smudges. To the half-tone block may be given the credit of hastening the adoption of hard packing, which shortly became general.

The writer well remembers the first half-tone that came into the office with which he was then connected, and the discussion that took place in the machine-room when it came to making it ready in the forme. The block itself, which was made by the Meisenbach method, had evidently been etched on a metal of a pale colour, having a somewhat brassy appearance, and the lines of the subject—a building—had evidently been much worked on by the graving tool to give a sufficient contrast to what, otherwise, would have been an extremely flat surface. In fact, so flat did it appear that the particular machine-minder into whose hand the flat-plate job was given was at first in flat rebellion. He wanted to know "how he was going to get anything out of a bloomin' block like that." However, he succeeded in getting an impression that, considering it was his first attempt to make ready half-tone, was not so bad, though the well-trained minder of to-day would, no doubt, be able to secure a much better result.

A "Colourable" Imitation.

Another early experience of half-tone comes to mind; somewhere about 1886 I think it was. An illustration in colours had to be reproduced in black and white in a reduced size, and it was submitted to a firm that at that time was one of the foremost in line work, and that was known to be experimenting in half-tone. The picture was returned with an intimation that being coloured they could not make a block from it, but if we could supply them with a print in black-and-white they would try. To the writer fell the job of taking the photograph and producing the print, and as there were no colour-sensitive plates or taking screens in those days the result may not have been what would have pleased a fastidious expert; but it served, although the line

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firm experienced great difficulties in getting a half-tone that would print. They did not possess a ruled screen, and made several experimental trials with fine muslin and wire gauze, of what nowadays would be described as 75 lines to the inch.

An Overlay "New Style."

Of course at that period 100 lines to the inch was looked on as a "fine" screen, and to get good printed results from a block of that mesh often taxed the skill of the printer to the uttermost. One little incident in connection with a half-tone I well recollect. It was a portrait block of about 7 by 4½ inches, and the minder had taken a deal of trouble to make-ready and spent a lot of time in getting his overlays. When ready to start he ran through a trial sheet, and was startled at the jump the cylinder of the press gave. When he discovered the cause he was mute. There were simply no words to fit the occasion. In regulating his grippers he had used a screwdriver, and laid it on the forme. Forgetting to lift it, he had run his sheet through, and the result was that about two inches of the blade was imbedded in the plate, to its complete destruction. Those were not the days of "half-tones in two hours," and the job was delayed nearly a week until a new block was made.

Glass Plates for Colour Masses.

Zinc, copper, and brass were the surfaces used for etching, as they are now, although some of the earlier experimenters used other substances, including iron, and an Australian inventor utilised plate-glass, which he etched with fluoric acid. A block of this character was sent by the inventor to this country as an example of what could be done with his invention, and it printed several long runs, being as good at the end as when the first impression was taken. The inventor got over the difficulty of mounting by using iron mounts into which the glass plate, which was about a quarter of an inch thick, was cemented. What became of this process I do not know, but there were possibilities in it for a certain class of work, particularly for the reproduction of pictures containing masses of colour or for the rougher class of coloured work, as the glass plate had no injurious effects on the inks used.

A Glue Ground.

One day, somewhere about 1889, several half-tone blocks of designs and trade marks were wanted for a job, and, as is a common occurrence, the price had been cut low, too low to allow of paying for the necessary blocks, at least so the boss said, and they must be produced in the office. Did anyone know anything about the half-tone process? Yes! somebody knew a little. Would they undertake the production of the blocks? No matter how rough they were, so they printed. They were made, and printed from too, but they did not pay the man who made them, whether they paid the boss or not. As the method of their production might be interesting, it is here related. The originals were in black and white and of a large size, and these were photographed down to about 3 by 4 inches on ordinary plates, without a lined screen, ordinary continuous tone negatives being the result. A pound of glue was got and melted in a glue-pot, and while hot was sensitised by the addition of bichromate of potash. Pieces of pica reglet were placed on a glass plate, and held in position by weights of metal furniture. The sensitised glue was then run on the plate until it was level

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with the upper surface of the reglet, and then the whole was put in a dark cool cupboard to harden. When sufficiently hard the glue was cut up to the required sizes; a piece of fine-mesh wire gauze was placed on top of the smoothest side of the glue, the negative was put on top of that, and the whole clamped in a frame and exposed to sunlight. Afterwards the glue plates were developed in warm water, allowed to dry, and were then mounted on wood by the simple means of applying hot glue to the underside of the plate and pressing it on the wood. The method was crude, and the results were perhaps cruder, but they printed the job, and that was sufficient. These glue blocks were long kept in the office as curiosities, and only the other day the writer was looking at one, very much warped and twisted, but still showing an image that might be printed from.

These glue-and-glass experiments recall the early efforts of the young German playwright Senefelder when he had been let down by a dilatory printer and had missed the Leipzig book fair and consequently had decided to become his own printer. He tried sealing wax as a printing agent and got very fair results, but was beaten at last by its brittleness. There's many a printing agent which is fairly practicable—or which would be if it were not that "there's allus a sumthink."

Need we be "Honoraries"?

In the early nineties the half-tone process made progress rapidly, and from then to now the methods of production have been improved and simplified, the time required for turning out a block has been amazingly shortened and prices have been lowered, until they show a contrast indeed with those asked for and received in the early days of the art. Whether the latter is an "improvement" I leave to the producers to say, but personally I believe the price-cutting of the latter days to be needless, while it is injurious to the blockmaker and of but little benefit to the printer, who gives his client the benefit of the reduction.

Tuck's First Decade.—Sir Adolph Tuck, Bart., presided at the tenth annual ordinary general meeting of Raphael Tuck & Sons (Ltd.), held at Salisbury House. In moving the adoption of the report he said the Company's first decade had now passed. He thought they had no reason to be dissatisfied with the results as a whole, bearing in mind the vicissitudes of trade in general within that period. Dividends to the amount of £289,650 had been paid during those ten years, and the sum of £79,342 had been placed to reserve, and by adding the £5771 they proposed to carry forward to next year, they arrived at the grand total of £374,764 earned by the Company during the first ten years of its existence. In other words, the business has shown an earning power of 75 per cent. on its total capital within this one decade. They at least could not be said to have failed in holding their own and in maintaining for their Company its premier position in the art world. The net profits for the year amounted to £35,106. To this had to be added the balance brought forward from last year, £4914, making a total of £40,021.

After deducting the directors' remuneration of £3000, there remained an available balance for the year of £37,021. After deducting the Preference dividends and the interim dividend of 5 per cent. per annum paid on the Ordinary shares for the half-year, there remained £17,021 to dispose of to-day. The directors now recommended the payment of a dividend on the Ordinary shares for the second half-year at the rate of 7 per cent. per annum, making, with the interim dividend already paid on the Ordinary shares, 6 per cent. for the year. They further recommended that £2500 be transferred to the general reserve, leaving £5771 to be carried forward to next year. The total reserve accounts now amounted to £79,342, an increase of £3401 over last year. This was agreed to.

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Facings and Pacings.

By "Ion."

It is generally worth while to see what the platemakers across the Atlantic are up to, be they makers of original or duplicate plates. Here is a page advertisement by the Rapid Electrotype Company of New York, Cincinnati, and Chicago in the September *American Printer*; boldly displayed, of course, though I naturally run it on here:

"Throw out your electrotype or stereotype plant; instal an aluminotype plant and make perfect plates for half your present cost. If you have no plant, you can now make your own book plates and save time, money, inconvenience.

"Aluminotypes are sharper, harder, and better than electrotypes. Aluminotypes lay ink like nickeltypes and will not rust nor corrode. Aluminotypes are a perfect reproduction of your type and require no make-ready, as they are made absolutely level and need no finishing.

"Sample book plates will be sent to reliable houses on request.

"We own the United States letters patent, and will instal plants in rotation that orders are received."

The Goss Printing Press Company (America) have taken out a patent (19,089, accepted December 2nd, 1909) which "relates particularly to a new and improved form of casting box, for casting curved stereotyped plates for rotary printing presses. Plates may be cast without risers or tails, thus doing away with the necessity for the use of tail-cutting machinery. It has for a further object the providing of a new and improved form of such casting-box which may be readily handled and easily operated by new and improved mechanism. By this means the two parts may be brought together and locked, and at the same time moved into position to receive a charge from the melting-pot, and the members may be simultaneously moved away from the charge-receiving position and unlocked."

A Hoe (America) patent improvement in machines for casting stereo plates is also worthy of notice. It is numbered 18,419, and was accepted January 13, 1910. This patent is for an "improved stereotype plate-casting machine by which stereotype printing plates may be continuously cast from a continuous supply of molten metal flowing from a suitable source, and the product divided into separate plates and automatically delivered. To this end the machine embodies a mould cylinder and a flexible matrix carrier mounted on a pair of rotary supports, which are arranged so that the matrix carrier is spaced from the cylinder, the matrix carrier and cylinder moving during the casting operation in parallel paths. Means are also provided for closing the sides of the mould thus formed, for delivering molten metal to the mould, and for dividing the product into plates."

The London Stereotypers' and Electrotypers' Union has elected a new secretary in the person of Mr. H. W. Clark, who was formerly secretary of the Stereotypers' and Electrotypers' Federation. This latter position is now filled by Mr. Warren.

Mr. A. Aufholz, of 4 Chadwell Street, Clerkenwell, E.C., has recently placed on the market a new air-brush, styled the "Invincible." Mr. Aufholz's special and large experience, and his expertness in this particular important branch of design and decoration, are well known. Mr. Aufholz will be pleased to give a demonstration of the use of the Invincible brush to any who will favour him with a call for that purpose.

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Printing on Nickel.

In an interview in a recent issue of *Nash's Magazine* Mr. Thomas A. Edison comes out with the startling suggestion that nickel may be used shortly as a vastly superior substitute for paper.

"Why not?" asked Edison. "Nickel will absorb printers' ink. A sheet of nickel one twenty-thousandth of an inch thick is cheaper, tougher, and more flexible than an ordinary sheet of book paper. A nickel book two inches thick would contain 40,000 pages. Such a book would weigh only a pound. I can make a pound of nickel sheets for five shillings."

Here, at last, says *Geyer's Stationer*, is comfort for the librarians who are crying out against the commercialism that produces paper so poor that most of the volumes printed to-day seem likely to crumble to dust within a hundred years. Here, also, is a prospect of real culture for the masses. Forty thousand pages in a volume! A single volume the equivalent in printing space of 200 paper-leaved books of 200 pages each! What a library might be placed between two steel covers and sold for, perhaps, seven-and-sixpence! History, science, fiction, poetry—everything. Indestructible except through fire or abuse. Beautiful, because the steel covers could be stained in perfect imitation of the finest leathers. Two hundred books for the price of one book!

I had understood Edison to say that he was making, for another purpose, the thin nickel sheets of which he spoke. That seemed to bring the nickel book close within the range of present possibilities. Then it occurred to me that perhaps he had mastered only the problem of manufacturing in small lots. So I said:

"Suppose you were to receive from a publisher an order for a sheet of nickel seven feet wide and 1000 feet long—could you fill it?"

"I could fill an order for a sheet of nickel seven feet wide and a mile long," he replied.

Then he told how he makes nickel sheets so thin. It is entirely an electrical process, accurate to a high degree. An electric current in operation for half a minute deposits on a prepared base one twenty-thousandth of an inch of nickel, never more, never less.

"An absolute law governs this," said Edison.

Photogravure Printers make an Important Business Change.

Allen & Co. (London) Ltd., 107 Clifton Street, Finsbury, who are well known as one of the leading English firms in photogravure reproduction and printing, are, as a matter of form, being wound up voluntarily for the purpose of incorporation with the new company, The Vandyck Printers Ltd.

This is the first step in a big extension of their business, and as a further preliminary, additional temporary premises have been taken in London to cope with the augmented flow of orders which has been steadily setting in their direction for some considerable time past.

We understand that an important development in the production of machine-printed photogravure is the cause of this change, and the new company hope to make further interesting announcements in the near future.

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"There's a Good Block Coming, Boys."

BUT we must wait a few years longer, is the opinion of the *Printer's Register*. It writes the following under the heading "The Vogue of the Dull Matt Art Paper":

"Doubtless the results obtained by the offset method have awakened the inventive powers of papermakers, with the result that they have produced a series of dull matt art papers of varying qualities and shades, but at most exorbitant prices. In the advertisement pages of a contemporary a so-called expert and consultant on matters concerning print mistook a printing paper at less than 2d. per pound for an expensive dull art paper at 6d. per lb. If such 'experts' are so easily misled, what shall be said of the ordinary printer! Doubtless, within a few years we shall have the choice of finish in art papers whether dull matt or bright, and both equal as regards printing qualities and price; but meantime the development lies between the blockmakers and papermakers.

"Half-tone blockmaking has not yet reached its zenith, and the results obtained by the offset process point the way to developments. Higher lights and deeper shadows and a freer finish to vignettes, leaving less to the machine manager—who more often than not fails to appreciate the artistic merits of the subject, measuring it only by the printing qualities of the block.

"Here is the opportunity for the inventor who can produce a block of a portrait or a picture free from the monotonous screen of the half-tone, with deep shadows, strong high-lights, and free finish. There is every reason to believe that within a few years this suggestion will be an accomplished fact, and that those who have looked upon the offset press with a view to producing finer illustrations upon papers with a matt finish than can be obtained by the ordinary letterpress method, will meet with disappointment. But it will have served its turn. Some of the finest specimens of offset work have revealed by contrast how flat and lifeless a great deal of our half-tone illustrations are and that the time has arrived for another step forward.

"No critic is satisfied with the results of half-tone prints on dull matt art papers as produced at present, even forgetting for the moment the almost hopeless task of keeping the blocks perfectly clean on a fairly long run. But here is the road to progress, and the first to reach the goal will be amply repaid for his efforts."

Colour Mixing.

WE do not agree with the writer of the following on colour mixture in the *Practical Printer*, at any rate not with his way of stating the case. But we will let his presentment appear as he contributes it. He writes:—"The five pigment colours, red, yellow, green, blue, and white, can be mixed to yield innumerable colours. Black and grey can be mixed from the first three. There is but one colour that cannot be mixed from the primary colours—a pure purple. Our pure purple comes from the anilines, mauve and magenta. The best purple from pigment colours is a mixture of ultramarine blue and madder pink. Vermilion and cobalt blue yield a muddy or dirty purple. A mixed green to be pure must result from a blue and yellow without reddish cast."

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Inter Alia.

Do you test your hydrometer or argentometer? Mr. Horgan recently found one which was so far out that water registered over 12° when it should have been 0.

The photographer he was trying to help in his "diff" had relied on a faulty instrument, and when he made up a silver bath to register 40° it was really only 28°, and consequently the negatives were weak.

To find the precise number of grains of silver in a solution the following, Mr. Horgan considers, is the better method: Take 35 grains of dry table salt and dissolve in 1 ounce of water. With a solution dropper, like a fountain-pen filler, drop 100 drops of silver solution into a glass and then drop into this some of the salt solution, slowly, counting the drops until it reaches the point where no more chloride of silver precipitate is formed. The number of drops of salt solution which have been added to the silver solution at this point are exactly equal to the number of grains of silver nitrate in each ounce of the solution. By adding 40 grains of nitrate of silver to each ounce of distilled water a new argentometer can be tested for accuracy.

A piece of rag wound round the nozzle of a water tap (Mr. Gamble reminds us), contrived so as to lengthen it a few inches, will prevent all splashes.

A dark cupboard in the dark room is the best place in which to keep all photo engravers' chemicals, even though all of them are not sensitive to light.

Process Work warns against fastening an oil painting upside down in front of the camera for copying, as the lighting of the picture will be different from that intended by the artist. The light generally falls on the canvas from the left, and always more or less above.

Why do we so often work with a light on our right when we could just as well have a light on our left?

If you are keen on introducing potash into your zinc etching bath to restrain the acid and promote the sharpness and smoothness of plates, remember the acid acting on the zinc is giving off hydrogen gas, and you should try to avoid inhaling this.

Working with one acid only, nitric acid, is a policy of zinc etching strongly endorsed by workers of much experience.

If you etch a few pieces of zinc in baths of varying strengths you find out just what you can do.

M. Victor Henri, in a recent paper before the French Academy of Sciences, has noted the influence of various physical conditions on the ultra-violet radiation of quartz mercury vapour lamps. Using the citrate of silver method for measuring the intensity of the ultra-violet radiation, the author has made determinations of the activity of a Westinghouse Cooper-Hewitt lamp under varying conditions of cooling. It was found (says *The British Journal of Photography*) that the ultra-violet radiation of the lamp is more intense as the temperature of the luminous tube increases. Cooling the tube with water gives only one-fourteenth of the ultra-violet radiation obtained when the lamp is in air, the waste consumed remaining the same.

A study of the activity of six lamps of different makes and ages showed that for experiments in photo-chemistry a quartz mercury-vapour lamp may be relied upon as a constant source of ultra-violet rays, the radiation being defined when the voltage, amperage, and length of the tube are known.

What a lot of engraving and printing processes have a great future—behind them!

Here's the latest G. K. Chesterton philosophy: A man is not free to sell his labour unless he is free to refuse to sell his labour.

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About Our Workers.

"*Homo sum; a me humani, nihil alienum puto.*"—TERENCE. ("I am a man; nothing that touches mankind is indifferent to me.")

MESSRS. WRATTEN & WAINWRIGHT are setting up works at Buda-Pesth.

This is considerate. Austrians and Hungarians must have been a bit puzzled by Great Britain. It has been shouting out to all the world for some years that it is a decaying nation; that it is merely continuing to be through the unaccountable forbearance of other lands. Yet, somehow, its decaying seems to spread over unaccountable decades. Well, it is by way of a mercy to puzzled wits in the Austrian empire that they will have a chance of seeing at first hand just how we are decading and—can't do things. Or shall I say, of seeing that after all we can do things; and that the British habit of invading foreign lands with conquering prowess is not lost?

So far, the best-known explanation of British predominance offered to Austria and Hungary has been that given by Mark Twain in a speech in Vienna. The British, he said, were mentioned in the Bible: "Blessed are the meek, for they shall inherit the earth."

Messrs. Zeiss of Jena have recently set up works at Mill Hill, north-west of the Metropolis. Our Croydon platemakers' advent in Buda-Pesth, considered as a happening in the same craft, may be taken as a little friendly return for the Mill Hill compliment.

We are asked to contradict the report that the head of the Zeiss Bund and Dr. Mees of the Wratten firm each spends the first hour of every day gazing at the portrait of the other, and gnashing teeth and shaking fists, all because each is trying to do the other out of his bit of Morocco.

Karl Klič, the pioneer of rotary photogravure, is a Bohemian. He studied at the Prague Academy of Painting. His father was a chemist, so he has probably been familiar from childhood with, at any rate, some of the governing conditions of photo-mechanical work. He doubtless arrived at his great development as Rowland Hill arrived at penny postage; not by some happy mental accident, but as the result of long, slow inquiries always directed to some such end.

Klič first set up a photographic studio at Brunn. Then in '67 he was working at Pesth as a designer, and later in Vienna he began practising intaglio etching on zinc. Close on forty years ago he was experimenting with zinc intaglio printing, and in 1875 he was working on photogravure. He used an aquatint grain with a carbon image.

In 1879 he gave the world a description of this method. Victor Angerer secured the process from him and practised it on a large scale in Vienna. Blechinger, Angerer's son-in-law, a painter and copper etcher, improved the process, and in 1893 introduced photogravures in colour into Austria. Klič went to England late in the nineties, and worked in great secrecy the rotary-photogravure process, known under the name of the Rembrandt process.

Mr. George H. Benedict figures in a group of five portraits of "pioneers in the cost movement" in the September *American Printer*. After dealing with Theodore L. De Vinne, Isaac H. Blanchard, J. Clifford Dando, and Paul Nathan, the writer of the article continues: "The engraving field also had its pioneer in the person of George H. Benedict, of Chicago. A year or two after the organisation of the International Association

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of Photo-Engravers Mr. Benedict for the first time unfolded his idea of doing away with the square inch method of charging and adopting the more desirable and more sensible way of selling by a scale."

Over forty years ago Theo De Vinne was in the van of many movements for the betterment of the craft he has so conspicuously adorned. He published a price list for the trade as long ago as 1869. He encouraged Blanchard to print in book form his system of cost-finding. Blanchard had suggested the training of an expert to go into city offices and instruct them in the matter of keeping cost records. Clifford, more commonly called Cliff, Dando, is said to have been the first to advocate the adoption of a standard cost and a standard hour value. In 1900 Nathan published *How to Make Money in the Printing Business*, which book has enjoyed a wonderful sale ever since, partly, perhaps, because it deals with the problems that arise from every source in the operation of a printing business, which suggests that there should be in it a good deal worth the attention of the engraver. As there certainly is in Cliff Dando's remarkable work.

Mr. Carl Hentschel, who is chairman of the General Purposes Committee of the City of London Corporation, has just issued a historical Guide to the Mansion House of London. Of course it is finely and copiously illustrated.

Apropos, Mr. Batsford, the well-known antiquarian publisher of London, issues a most delightful work upon the architecture of London. The author is that authority on the traditions and developments of architecture, Mr. W. Godfrey. There are many scores of most realistic half-tones; and a number of sectional maps are of the greatest assistance in the readier apprehension of what our guide has to tell us.

The drawings include some powerful sketches in black-and-white by Mr. E. L. Wratten, who is a shareholder in Wratten & Wainwright Ltd., and incidentally has lent his designing skill to the purposes of that justly fastidious firm—whose very wrappings, if you please, must have an artistic distinction of their own.

Mr. C. W. Bowerman, M.P., commonly spoken of as the working printers' member of Parliament and lately Secretary of the London Society of Compositors, has been appointed to the general secretaryship of the Trade Union Congress, at a salary of £300 a year.

The late Sir Henry Howe Bemrose of Derby, chairman of Messrs. Bemrose & Sons Ltd., printers and publishers, has left estate of the value of £90,077.

A good portrait of the late Sir Henry Bemrose figures in the *Inland Printer* for September. Sir Henry is described as one who was "a powerful factor in trade movements" in the United Kingdom; and another tribute by this American writer is that "the pursuit of good literature was with him at once a hobby and a passion."

DR. J. H. SMITH of Paris is credited by the *Glasgow Herald* with having accomplished sun printing in colours without the use of solutions or developing agents. He was at work on a bleaching-out process some years before the introduction of the Autochrome plate. He has prepared a paper which he calls "Uto-color." It is placed on the Autochrome or colour plate in the printing frame and printed in the sun for about two hours or in the shade a longer time; and the paper acquires, says the *Herald*, the colours of the plate. It is duly "fixed," and mounted as an ordinary photograph. "The finished print corresponds very closely with the original Autochrome, all the fine details of light and shade being represented, and the colours are said to be rendered true to Nature."

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The Honorary Blockmaker.

THE following is a modern modification of some verses by F. Colebrook which were published in the *Process Year Book* about twelve years ago. One or two happenings of this autumn suggest that there may be a certain timeliness at this juncture in this rather owdacious doggerel:—

Green—Honorary Blockmaker—he smacked his shrunken thighs,
For his customers' fat dividends, he read, were on the rise.
"They're up, I see. They're up—*through me*. And I'll move them up once more;
For I love it—O my customer!—this swelling of *your* store."

"It's five o'clock. Boy, fetch my loaf. No butter—can't afford,
But crusts are meals for one who feels rich joy in patrons' hoard."
Thus reasons he, and faithfullee, e'en while he eats, he works;
Nor "perc" nor "nit" more dogged bite, than he who never shirks.

The men went off. The foreman then and Green worked on again
Till sudden drowsiness confused the Honorary's brain;
And lo! there fell a joyous spell, with his snatched sleep that night
He almost wept, the while he slept—things were so wondrous bright.

THE DREAM.

He dreamt he was slowly on the mend, had been ill through overstrain,
Each customer had proved a friend, had sent port and port again;
Jellies and flowers, all sweet with scent of gratitude profound,
And from religious houses came some tractlets, nicely bound.

And he dreamt of a deputation from the firms whose slave he'd been,
With an address for presentation to the Honorary Green;
All the colours of the rainbow—not a tone or tint forgot,
A choice illumination of appreciation rot.

He felt now like a prisoner, with freedom come at last,
All honey, if no money now, all biting acid past.
"Pardon bare walls and broken chair, and naked floor," said he.
"I'm poor, but I am overjoyed your gratitude to see."

From its Alpha to its Omega he read the glowing strain;
"As you say, 'tis true,—I've slaved for *you*,—and so I will again."

"While I think of it," said one visitor, "as yet we have not paid
For the address. May I solicit—er—ah—um—a sovereign's aid?"

* * *

THE AWAKENING.

You see stars here, and stars were seen at that last final dart
By our worthy Honorary Green; he woke with sudden start.
"Glad you're awake," his foreman said. "Cutts sends to lets us know
He'll pay but twopence for half-tone, he can get it much below."

"No overtime, no minimums; no other houses do;
That's what he says, and underlines, that their *Wayzgoose tip is due*;
I fancy it's a tricky clerk, though writing in Cutts's name;
We'll hear no more of this 'try-on' if we don't play his game."

The foreman sighed; he'd done his best; but he well knew Mr. Green.
"The Governor's sure to yield," he said. But a change came o'er the scene;
That dream had worked the oracle, that sleep had ope'd his eyes;
He drowsed away a gentle fool, and wakened fiercely wise.

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He wrote a note to Cutts that burnt the envelope *en route*;
He collected his price circulars, and ash-binned all the shoot.
He vowed that they should take his name from the "Honorary" list;
He dotted down those customers who never would be missed.

He called his workers; man to men, he put the matter straight.
If more was not from the public got, their wages must abate.
They saw it. Men of various shops, wiser than "heads" had been,
Began a fight for sale price right, for a little "fat" with "lean"

* * *

Thus various honor-aries found rescue from below.
What they'd Smee-batteried long about, the men achieved "quick pro."
No longer masters fooled long hours in estimating skill
Only to tax their rivals' power to go one lower still.

No more was known fair overtime which masters dared not charge;
And allowance time "past closing," shrank, which had been fine and large;
And "quick pro" ceased to be a bane, and work was better done.
And I trust a little wisdom has mingled with this fun.

MESSRS. GEORGE MANN & CO. LTD., of Leeds and London, in conjunction with their Italian agents and a large user of their machines, made a display at the Turin International Exhibition, including a Quadcrown patent two-coloured rotary offset machine, a demy patent single-colour Rotary offset machine, a quad-royal direct rotary litho machine, and a double-demy patent rotary tin printing machine. There were also on the stand a bronzing machine, a "Broadway" press, a grainer, and an ink mixer. Some printers were running these machines and doing fine colour work from "Mann" offset.

A "Baby" three-cylinder offset machine has also been installed by Messrs. Mann in the Leeds Technological Institute, and has given the greatest delight to teachers and students.

Our Interviews.

No. 1. A NEWCASTLE ENGRAVER'S GLOBE-TROTTING.

The occasion—The native Judge of the High Court—"Throw physic to the dogs"—Camera failures, and why—"Strange home news"—Australia's "holes in her own coat"—A shadow's substantial proof—The world a small place—Mayor-baiting—"Cool houses"—The composite chain—Good process work—Trade unionism—Wages boards.

MR. PHILIPSON'S countenance, frank and benign, looked out from a page in the February No. of this Journal—one of the rather oval faces which square jowled men will have it are the stamp of the ineffectives. Mr. Philipson, our own editor, and the late Mr. Wm. Shakespeare, of Stratford-on-Avon, come under that general condemnation by the square-headed. In their different degrees all three have succeeded in concealing or partly concealing their sad disability; in fact, the two former are prepared to put up a very good case for the broad dome forehead and the oval below. With the last-named we are not able to communicate, as no doubt Mr. Stead's other-world bureau is fully occupied. The whole Rechabite Order, founded to promote temperance and thrift, are prepared to back the claim so far as Mr. Philipson is concerned, for they have elected him President of their Order. In that connection he has just done a good deal of world travelling. And nothing would do but we must ask this Newcastle engraver (head, as the reader will remember, of Philipson & Son) to give his brother craftsmen through our columns some account of his wanderings.

"What led to your journey?"

"An invitation came along for a deputation to proceed to Australia to take part in the Rechabites' Jubilee celebrations in Victoria. Eventually I undertook a share of the work and found that the original idea was soon far exceeded, as all the branches on the way out and home put in a claim for a call by the deputation, and I found the tour included India, all the Australian States, and New Zealand; and a fortnight was to be spent on the South African coast.

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"I joined the *Marmora* at Marseilles, which called at Port Said long enough to enable us to get a look round and sniff some Port Said solids.

"The Canal and Aden were naturally most interesting features in the journey," he continued; "and soon we reached Bombay, arriving, in fact, just the day after the Mohurran riots. Our party drove several times through the region of the disturbance, which was then well guarded by soldiers camped in the streets. In Bombay I was presented with a beautiful illuminated address, the work of a native artist, enclosed in a finely worked tube also native craftsmanship."

"I suppose you soon got to work?"

"Yes. An important public meeting had been arranged at Bombay to receive the deputation and to advance our movement. The chairman was a very remarkable man, a native Justice of the High Court of Bombay, Sir D. N. Chandavarker, and he spoke most eloquently in English and of the English. The chairmen of all the meetings in India when they spoke at all always gave their addresses at the end of the meeting. It was very pleasing to a representative Britisher to hear an Indian gentleman speak in such terms of the British occupation of India as he did. He gave it as his opinion that the coming in of the British occupation was providential, for although it had not brought equality as between man and man, it had brought what India had never had before, viz. equal justice to every man.

"The tour in India took us over 5000 miles in twenty-one days, and our escort, knowing they had one elderly gentleman on their hands, provided themselves with a medicine chest which cost them £5 or £6, intended to meet all emergencies and to cure all the ills the deputation might chance to suffer, but all the medicine that was supped was supped by the escort themselves. India at that time of year was very dusty and arid, and travelling long journeys was dry work, but we neither drank medicine or Bull Dog Stout or Green Striped Whisky. I spoke at forty-two meetings in twenty days, and got right up to Rawalpindi, where I needed the winter clothes I set out from home in."

"Did you see many of our soldiers?"

"The nature of our mission (total abstinence and thrift) brought us into contact with Tommy Atkins in many of the military stations, while the commanding officers wherever we went entered very heartily into the programme, usually lending the station theatre and presiding over the gatherings. They themselves with their staff appeared in full dress, and their ladies invariably gave us their countenance and helped with the programme. It was very evident to me that the army authorities in India are making the raw recruits we send out to them into useful chaps; and when their time comes to return they will come back better men than when they went out. The strange fascination of India lies in the people, the myriad abject-looking folks, with never a smile, and making unending clamour that overpowers all else. The problem of India lies there also—the problem of their sustenance, sanitation, and elevation. Art has had a wonderful place in the India of the past. What revelations of it in architecture and the handicrafts—from the Caves of Elephanta and the Pearl Palace at Delhi and the Taj Mahal at Agra — to the cheapest paper knife you can buy."

"What of your camera the while?"

"My photographic attempts were not uniformly successful. Much loss resulted from the unaccustomed and

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desperate variations of light and shade. I took with me twelve dozen Kodak films at 3s. a dozen, and these served me through India and Ceylon, but I had to buy in Australia and New Zealand at prices ranging from 4s. to 4s. 8d., and it was not until I got to Sydney that I found any at 3s. The total result is a well-filled album with a few hundred views of persons and places which of themselves will keep alive the reminiscences of the run round.

"In Australia the generality of the people I talked to appeared to have some very erroneous views of the old country. Far too many have read and swallowed all that is written against the home-land, and are quite sure our people are as a whole wallowing in poverty, squalor, and misery. They seem to apply the ordinary description of the submerged tenth to all, and somehow I do not wonder at it, as I know with what avidity the audiences received descriptions of slum life in London which I once or twice had the misfortune to listen to. On that tack a speaker can often wax very glib and educe sympathetic cheers, and in the end entirely mislead. It is too bad for Australians when they come home to visit the slums and then represent British life and conditions in such a way as to lead their people to think that there is little or nothing else. Even in Australian cities, in which nearly half her people live, they have congestion, unemployment, and slumdom, not as bad as ours, but bad enough for a 'tu quoque' if one was inclined."

"Do the leaders of the community seem alive to this evil, present or prospective?"

"It is only fair to say that they are taking vigorous and sensible measures to obviate slum conditions. Their towns and cities are spread around on larger sites, and on Garden City terms; while drink has not such a hold. Equally ludicrous are the ideas held in some quarters as to our weather at home. I was often told we had no sunshine; but *always* clouds and fog and frost as our *common* lot. I had a very good answer to that in my first photograph, for when we got aboard the *Calais* at Dover I stepped back on to the pier and took a snapshot of the boat and my colleague. I got both all right, but I also obtained what I did not expect, viz. my own shadow on the side of the boat—a very distinct silhouette. That was proof positive that in mid-winter on 28th December the sun was quite well in evidence in England."

"'The man and his shadow' — new style."

"One young lady doctor who was staying in the same boarding-house at Hobart in Tasmania was quite cynical, especially about the English women. Her own appearance, if it had to be taken as typical of Australasians, was none too flattering to them. She was thin and 'sicklied o'er with the pale cast of thought.' She wanted to know what the women of England were really like, as she had never yet seen a presentable English lady. When she had committed herself fully to the disparagement of our womenfolk I reminded her that she had only to recall to mind what her own mother and grandmother were like, to realise some idea of English women (for I rightly guessed the family had not been away from England quite one generation). And if that would not do she could try and remember that our hostess Mrs. W. was only forty years out of England and was not a bad specimen of a six-foot Lancashire lass, sprightly, trim, and active

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at sixty-two. This lady hostess of ours was undoubtedly a typical Britisher, having a firm hand equally in her household and when driving her wagonette and pair of cobs up the heights of Mount Wellington or along the coast to Brown's Bay, trips which she delights to take for the benefit of favoured visitors.

"My host was a venerable man of eighty-six, and as I was standing in the lobby of this boarding-house taking my leave of him, he asked me as to my itinerary, and on my mentioning that I was going to Rockhampton in Queensland, and that I was particularly going to the latter place as my old schoolmaster Mr. Potts was still alive and residing there, he said, 'I knew Mr. Potts quite well, and what is more, when Mr. Potts landed at Brisbane forty years ago he applied to me, who then had a chemist's business in Brisbane to take his eldest son as an apprentice.' So he knew all my schoolmaster's family and his one time apprentice intimately. Mr. H. W. Potts, his apprentice, was now he said, head of the N.S. Wales Agricultural College at Hawkesbury. I afterwards met him and was shown all the ramifications of his 3000-acre educational establishment. I had been in correspondence with Mr. Henry W. Potts, and he had made my appointment with his father. I not only saw Mr. Potts senior, but many of his Rockhampton pupils grown to man's estate."

"Quite a tale for a journalist."

"Well, the Rockhampton newspapers duly announced that I was visiting the town and was staying with Mr. Potts, and that I was one of his pupils in the old days on Tyneside before he emigrated to Queensland. That alone was sufficient to secure me a great welcome into Rockhampton, where I arrived on Referendum Day. At the reception banquet in the evening all the friendly and kindred societies were represented, and the Mayor presided. Most of the younger men present had been at school under the same master as myself, and that bit of 'fellow feeling made us wondrous kind.'"

"What of our craft in Australia?"

"Process work as I found it on the trip exemplified in the newspapers and Australian magazines was very good. The country towns have a surprising appetite for local papers, dailies and weeklies, and it often happens that the publishers of the dailies also bring out a well illustrated weekly for which they charge 6d. Tasmania and New Zealand are well to the fore in respect to the quality and bulk of their sixpenny weeklies. There are no halfpenny papers in overseas dominions that I saw or heard of.

"While in Melbourne I had the honour of being the guest of a leading printer in that city, and much enjoyed a look over his extensive and up-to-date works, and I found nothing to find fault with in the way the numerous illustrations were being reproduced; in fact, they were quite up to the average of similar work I have seen at home. Prices were higher, but not so much as I expected considering the generally high wages paid to all classes. Labourers are not paid less than 7s. a day, mechanics will get 9s. to 12s. a day, and from what I gathered process workers, printers, etc., do not exceed mechanics' figures.

"I was looking over a workman's house, semi-detached, built of wood with the invariable corrugated iron roof and beautiful verandah, with a quarter of an acre of garden, in a country town. I asked the young man if he had any difficulty in getting hired help to do his big garden. 'Oh,' he said, 'we cannot afford to hire jobbing gardeners here.' It would

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cost 8s. a day. So he did it himself. He was a strong trades unionist. I found out also he cobbled his own and family's boots and shoes. He was also painting the whole house, gates, and outbuildings.

"The State has a deal to do with regulating hours and wages; eight hours is the general rule, but some trades have less. The Saturday half holiday is secured by law for all shops and works. Refreshment and public-houses are exempt, but at the civic welcome given to us in Melbourne by the Lord Mayor, Mr. Edgar, one of the Federal Ministers who was representing the Prime Minister at the function, threw a bombshell into the liquor camp by saying that the Government contemplated bringing in a measure to bring the public-houses into line with the shops in regard to the Saturday half holiday.

"A Wages Board has also been at work some time and can be called upon to fix the wages of any establishment. One gentleman who went to Queensland twenty-eight years ago from my own locality has been long engaged in the café, confectionery, and bakery trade. He told me he was doing very well up to a few years ago, but the Wages Board had upset his apple cart. He was paying his young women 12s. a week and their food, but the Wages Board altered all that and he had to pay the same girls 27s. I certainly would have thought 12s. a week an insufficient wage for a young woman in Queensland, but the 27s. a week made things such that it was hardly worth while to take all the trouble and responsibility of business for what he was getting out of it.

"I was in ten different steamers, and travelled twenty nights by rail in the sleepers. In New Zealand alone I travelled 300 miles by motor car, and in all covered 45,000 to 46,000 miles. Undoubtedly the sunny lands of the overseas British dominions offer splendid openings for the sons and daughters of the home lands not perhaps for the process workers, or for would-be town dwellers, but for those with the brawny arms, with or without capital (better with), and those who can face the isolation of country parts and back blocks.

"I suggest to those who do go out, to go with recommendations from their friendly society branch at home to the friendly society branch where they are going to. No better introduction can be taken. The friendly societies are very vigorous and widespread, and will give help at the very outset where it is most needed."

"I'm afraid I interrupted you when you were speaking of that Rockhampton banquet."

"The Mayor gave me a kindly welcome as did every civic authority whose boundaries I touched. To be sure, on this occasion the Mayor thought it proper to point out a better way than our rigid abstinence combined with thrift. His specific was moderation with pure beer and spirits, allied with thrift. It was hardly the thing at our banquet, where he and his numerous friends were our invited guests, to traverse our distinct principles in that way; and he went so far that in the kindliest way I could I had to reply to the theories he had advanced quite as strongly and as pertinently as he had made the attack. One of the newspapers of which Rockhampton can boast, next morning referred to the friendly tilt between Mr. Philipson and the Mayor, and proceeded to back up my position by the latest scientific evidence.

"The Mayor took it all in as good part as I had taken his criticism, and invited me on my return from Mount Morgan,

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whither I was going next day, to have a run round in his motor car, and by that means I was taken through their beautiful tropical garden. They boast an extraordinary display of coleus and ferns, and a very fine avenue of pines. They go in largely for glass, but it is no question of heat with them—rather of shade and moisture. Coolhouses are as great a feature there as hothouses are with us. It was in those gardens that I came across the only traveller tree I have seen. It is a large palm-like tree having spreading branches with grooved leaves, so that the rain or dew runs down the grooves of the leaves into a channel in the branches; this leads into the trunk of the tree, which is hollow, and constitutes a massive rain barrel, storing the pure water for future use. The curator has this specimen enclosed in his own private quarters for security. Taking his pocket-knife he tapped it and handed me a good glassful from Nature's distillery, and quite fresh and cool it proved to be.

"I have mentioned Mount Morgan. This has been a mountain of gold, but is partly worked out so far as gold is concerned, but is still doing well with gold and copper combined. As a rule, it is feared that more capital is sunk in gold mines than is ever recovered from them. Mount Morgan is certainly an exception, for it is estimated that £12,000,000 has been got out of it, and £7,000,000 has actually been paid to shareholders in dividends."

Mr. Philipson had frequent inspections of gold-mining places, and at the Boulder W. A., Ballarat, and Bendigo saw silver mining as carried on at Broken Hill, and also saw copper mining at Moonta.

"On the West Australian goldfield everything depends on the water supply, which is one of the engineering wonders of the world, with its line of pipes from the hills near Perth, through which the water is pumped 400 miles into the interior—a distance equal to the length of England itself.

"Ballarat is one of the prettiest spots I visited. It stands 1700 feet above sea level and is beautified by spacious gardens, not only in their parks, but in the city itself. They can show an exceptionally wide thoroughfare, their principal street having the largest and most beautiful street gardens I have ever seen. My audience here on the Saturday night numbered about two thousand, with a choir of young women four hundred strong, conducted by a local clergyman."

And here came in a proof that our friend has not taken a pledge against listening to compliments. But let him make his own confession.

"During the course of my address, to show the world-wide character of the Rechabite Order I had occasion to explain my presidential chain of office. The chain has a wonderful history. It is all of fine gold and was the gift of the Scottish Districts at Edinburgh in 1897, and consisted of over one hundred chased links—with presentation shield plate at the bottom. Four years later the Welsh Districts contributed a beautiful medallion made of Welsh gold by Welsh workmen and subscribed for by Welsh members. In 1907 the Australian Districts combined to send a medallion made by Australian workmen in Australian gold and enamel. This was presented to the Order by an Australian veteran who came over purposely when the H.M.C. was held at Newcastle-on-Tyne. At Bombay the Indian Empire District had prepared two beautiful Stars of India made of finest Indian gold by Indian workmen and subscribed for by the Indian Empire members. All this has enhanced the beauty of the

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chain of office, and added to its value both intrinsically and sentimentally. I said they might want to know where the English part of it was, and they would find it within the circumference of the chain in the shape of a grizzly face and shining head. They took that on all right, and when the meeting was over I turned round to the conductor and his choir, and several of the young ladies immediately put in a protest that when I was explaining the chain I never turned round to them and they had not been able to see it to appreciate it so well. After special inspection in the anteroom several ladies said, 'Well, after all, they liked the English part of it best.' I set that down as the nicest compliment I got on the trip."

Wallpaper and Fabric Printing by the Mertens Intaglio Method.

THE Intaglio rotary process of Dr. Mertens is the subject of the following article in a recent issue of the *Times* Engineering Supplement :—

"A new process, now being perfected, for the printing of wallpapers and textile fabrics will mark a distinct advance in this branch of industrial work. The demand for textile fabrics in Europe dates back to the twelfth century, and the early methods of decorating them were necessarily confined to the weaving. The printing of fabrics has at the present time a most extensive application, which has been very materially assisted by the great advances of late years in the manufacture of aniline colours, but until now little work has been done in the production of really pictorial effects by printing. Chaste and æsthetic designs, many of them complicated in character and colouring, are produced, but the new method of printing in intaglio will at once change the aspect of the matter completely, and will admit of better defined and more elaborate work being done.

"The intaglio process, as applied to the printing of textiles, consists in pressing the fabric with considerable force against the copper roller of a rotary press, the pattern being engraved in a particular manner on the roller. The number of rollers used for the printing of a fabric depends on the number of colours required by the design, but some admirable work has been done by the three colour process, so that in three consecutive printings every colour in a design is faithfully reproduced. This alone opens up a new field for the work.

"A photographic celluloid transparency of the design is made with the use of the special intaglio photo-mechanical screen, and this is wrapped round the copper cylinder, the surface of which has been previously coated with fish-glue and bichromate of potash. The roller is exposed under the photographic film to light, and developed with a solution of ferric chloride in the way familiar to photo-engravers, and the roller thus etched is ready for the machine. The roller, while rotating, dips in a solution of printing ink, and the engraved design takes up the ink; a steel scraper removes the excess of ink from the smooth unengraved surface of the copper, so that when the fabric is brought into contact with it, the material takes up the engraved design. A heavy steel cylinder presses a rubber roller against the copper roller, and the fabric passes between the rubber and the copper surfaces. After impression, the fabric is led away over steam pipes, and the printed design dries within a few seconds, when the textile is rolled up.

"The very high pressure against the engraved roller and the fine character of the intaglio screen render the results remarkably clear and sharp, and enable the printer to obtain a great amount of detail. Dr. Mertens, who has practically brought this new system to perfection, has succeeded in producing some excellent photographs on fabrics. The grain of the screen is so fine that the results look much like ordinary photographic prints; and this work will probably create a popular new departure in textile printing. Landscapes and portraits can be printed on silks or rough fabrics at will, in any colour.

"An important feature of the intaglio process is the rapidity with which the printing can be carried out. With wallpapers, something like ten thousand yards an hour can be printed, and it seems quite possible that fabrics may be manipulated with the same speed and facility. The machines for this work are being constructed in Switzerland, and some of them are already in use for the printing of illustrations on very cheap classes of paper."

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My Causerie.

My good friend Mr. R. A. Cheffins of the Press Etching Co. is certainly among the number of those who may say, "I have known what pleasure is, for I have done good work." He had not the easiest of tasks when called upon to reproduce the full-page illustrations forming Arthur Moreland's series of *Humours of History*. Line drawings are "kittle cattle" when they are to be turned into colour. It may be argued as to whether it should be done at all. If done, it should be done vigorously, as here.

Arthur Moreland and Mr. Cheffins are long time friends. They both take their ease in the same gathering-ground, the Press Club, of which Arthur Moreland has long been hon. secretary, and Mr. Cheffins one of the oldest members. It is through the frank and confiding causeries of this delightful rendezvous that the habit of meticulous truthfulness has been contracted by both these workers in the illustration field—the truthfulness which is so strikingly manifest, for instance, in the portrayal of the incident of King Alfred's burning of his cakes. But for Moreland's antiquarian studies we should never have known that the attire of the woman who gave Alfred "what for" was almost identical with the seaside landlady's costume of to-day; we should not have known that Harold received news of William's landing in 1066 by wireless telegraphy.

There are a few of these cloth-bound books with their 160 Prescoltint sketches on sale at the *Morning Leader* office for one shilling as a clearance price. Surely the opportunity should be taken by, at any rate, enterprising printers or publishers. There are always conversaziones or whist drives or "socials" of some sort at which this sort of a book is an admirable time filler. And incidentally the distribution of such work means that the public becomes more and more familiar with various kinds of colour work. The more it sees the more it is likely to want. Besides, what's the matter with the poor printer or publisher's having a laugh or two, and even paying a shilling for his own entertainment?

Mr. Cheffins is an enthusiast for line work. In that he may not be alone, but he is perhaps more vocal than some in protestation against the modern tendency to cut down line price to a point—to a disappoint—which hardly admits the possibility of producing really good line work and making a profit. There is no point connected with process upon which the public are more ignorant, and more injuriously ignorant, than upon line. What lamentable difference would not examination constantly reveal between the line work subject as sent to the sweated engraver and the line block which is sent out from his studio. As Lord Halsbury of "sort-of-a-war" fame might say, he sends out a sort-of-a-reproduction. It is "there or thereabouts." It is the best you have a right to expect; at any rate if you have been a cutting-down sinner. As a charming writer upon old English fairs once sagaciously observed: "It may be true that the boa constrictor isn't eating the rabbit, as the picture outside the booth led you to expect. But there *is* the boa ready to eat. And there *is* the rabbit ready to be eaten. And what can you expect for tuppence?"

Burgess gave a tonic to Vigoral and to Phosferine when he zig-zagged his fifty miles or so in getting across the Channel. He also gave a filip to Dent engraving. He did that good by stealth, but not his own; he did it by Dent's legitimate stealth. Which being interpreted means as follows. Mr. A. E. Dent a year ago brought out a smart series of humour picture post cards, each one having a comical subject. The artist depicting quaint Caliban-like figures, and the Dent staff doing good three-colour half-tone, between them produced a very good advertisement of the firm's products. It chanced that one of these represented a swimming race between two of these odd-looking monsters—a race in sea water, steam boats being in attendance. The letterpress started with a sentence as to "how great a fire a little water kindleth" and ended up with recording how Dent won. Quite good advertising, it seems to me. And much improved in its advertising effect by the prompt reissue, hard upon Burgess's win and as the consequence of that win.

Facing me as I write these notes, and forming the principal framed picture upon the wall, is the portrait, about 12 by 10, of Dr. Horton, the well-known Independent minister of Hampstead. As thus presented to the eye, it is a Hentschel-colourtype reproduction of a water-colour portrait. The gifted artist is an old schoolfellow, Frank Ogilvie, now and long time living in the Garden City, more prosaically known as Letchworth. He has since reproduced other of his paintings in this way, notably a group of the Campbell-Bannerman Cabinet as it was first composed. In adopting this mode of securing wider vogue for the creations of his facile brush, Mr. Ogilvie does

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the obviously right thing; and the obvious thing —the thing recognised, that is, as the obvious, once it is pointed out—is commonly the very last thing witnessed in practice. Ogilvie's action suggests to other artists that there is a larger public to be reached in this way. There are myriad walls which might talk to the dweller in his home, talk very pleasantly, very refreshingly, from day to day, by means of the speaking likeness of this, that, and the other man or woman held in special honour or affection. I don't say whether there was or was not a large sale for this particular portrait or the cabinet group; I haven't the details; and indeed am quite prepared to hear that in this beginning of the three-colour portrait reproduction for the sitting-room wall, there were the difficulties usually encountered in the introduction of any new usage. If they occurred, they do little or nothing to derogate from the force of the suggestion to the whole engraving profession, and to printers and publishers. More power to Ogilvie's elbow, say I. I was almost writing, more power to his album.

Poor old Samson. He has been hard worked enough ever since he was put to grind corn for the Philistines. It was an advertising journal which made use of him the other day, to point out what a strong advertiser he was,—how he once took two whole columns and brought down the house.

I feel like turning him to account once more in illustration way. For only Samson, effecting more in death than in life, seems quite to illustrate what the Crystal Palace is doing. To be sure it has presented to view, amid much comparative rubbish, a good many things which have had real title to be called works of art. It has shown a good many things and many good things.

But the catalogue issued for the sale occasion is a worthy production; and it is a real service to the engraving art, for it exemplifies strikingly how much could be done by the engraver to assist high commerce if he were called in more often and paid less grudgingly.

Messrs. Knight, Frank & Rutley, the well known City auctioneers, are of course the issuers. They have adopted photogravure as the medium, and they give us a liberal gallery of pictures, all illuminating some episode of the Crystal Palace history.

No doubt auction particulars of the more important properties have tended of late years to be more elaborate and more embellished pictorially. Still much remains to be done, and I am glad to see the Crystal Palace auctioneers doing something which should contribute to the good of engraving, while contributing to the moment's purpose of the auction sale.

F. COLEBROOK.

Index of Current Literature.

Zeitschrift fur Reproduktionstechnik for September contains as a supplement an example of the rotary photogravure by Messrs. Bruckmann, and articles on "The Influence of Ultra-violet Light in Three-colour Exposures," "Etchings on Brass for Illustrations or Embossing," "Comparisons of Intensifiers and Reducers," "Dust Grain in Photo-engraving," "Setting-off of Printing Inks."

Le Procédé commences in August to reprint Wratten & Wainwright's new book on *Orthochromatic Filters*, and also has a contribution by M. Caillier on "Intensifiers for Dry Plates."

The Inland Printer for September deals with a mode of transferring old wood engraving prints to wood.

The plate engraving of business and calling cards, wedding invitations and the like, is not within the exact lines of the process engraver's ordinary business, at any rate where he is process engraver simply. But there are a good many engravers who have at times had to work or to supervise work by this non-photographic engraving; and it is worth mentioning that the *American Printer* for September deals with the way in which plate engravers and plate printers meeting in convention have lately tackled the cost problem. A leading firm had caused a competent accountant to instal an adaptation of standard cost-finding system as adopted in printing houses. Mr. Chandler placed the result before the Convention: "As was to be expected, the hour cost figures presented seemed incredibly high to men working in the dark, without a cost system."

A table of costs shown at this Convention is reproduced in this issue of the *American Printer*.

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City and Guilds Examinations: Photo-Engraving Prize-winners.

THE following are the prize-winners in the examinations of the City and Guilds of London Institute, appearing in the list recently issued by them. According to this it would appear that no prize was awarded in the Honours grade in Pure Photography, and that the first prize was not awarded in the Photo-mechanical section in the Honours Grade.

Photomechanical Processes.—Honours grade: Second, £2 10s. and silver medal, S. Sahasra-budhe. Ordinary grade: First, £1 10s. and bronze medal, H. D. Halstead; second, £1 and bronze medal, J. Hurst. All three of these winners came from the Manchester Municipal School of Technology.

Pure Photography.—Ordinary grade: First, £1 10s. and bronze medal, A. Dashwood-Howard; second, £1 and bronze medal, N. F. Horne; third, bronze medal, A. S. Gannon. The first two prize-winners came from the Thornton Heath Polytechnic, the third from the Battersea Polytechnic.

We published in our June number the questions set in the examination in which these photo-engraving candidates were the prize-winners.

The Newcastle Engraver and the Insurance Bill.

THE Biennial Conference of the Order of Rechabites was opened at Southport by an address delivered by Mr Philipson (of Philipson & Son, engravers, Newcastle-on-Tyne), in his character of High Chief Ruler. He criticised the Insurance Bill strongly on account of its compelling contributions from friendly society members already adequately insured, because the objectionable system of keeping contributions out of wages had been adopted, on account of the secretarial difficulties it will cause, and because the link between the friendly society and the member is weakened by the system of collecting contributions. He also referred to the fact that under the Bill doctors are to be paid about twice as much as originally expected. The friendly societies would be left with heavier liabilities, owing to the State scheme absorbing the best members and leaving those over 65. The Rechabites' individuality would have to be sunk in the health committee, and there might be difficulties with regard to the Rechabite pledge. On the other hand, he expressed approval of the Bill for its contributory principle, maternity benefit, suspension of contribution when sick, inclusion of all workers, sanatoria benefit, exclusion of accident, and limitation of sick pay. He called on the friendly societies to unite, as the doctors had done, to obtain essential amendments. The Rechabites should not commit themselves to be an approved society until the final shape of the Bill was seen.

It is interesting to note that on the following day, High Deputy-Ruler Platt (Bury) moved a resolution from the Board of Directors as follows:—

"That this conference, representing over 430,000 members in the United Kingdom, while expressing extreme regret and disappointment that the National Insurance Bill now before Parliament differs so materially from what was anticipated from the views previously expressed by members of the Government, recognises the national importance of the measure. Conference, therefore, desires to have such amendments inserted in the Bill as will safeguard the interests of friendly societies."

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School Notes.

THE BOLT COURT CLASSES.—The prospectus of the classes in photo-engraving, lithography, etc., which are held at the London County Council School of Photo-Engraving and Lithography may be obtained on application to the Principal, Mr. A. J. Newton, who has returned in good time from the Turin International Exhibition, where he has acted as a juror at the request of our Board of Trade. The classes commenced on Monday, September 18, and during the rebuilding of the school in Bolt Court are held in the temporary premises, which have been very efficiently equipped at Fleet Lane, Farringdon Street, E.C. The courses of instruction include photography for reproduction purposes, the preparation of originals, and the making of negatives for line, half-tone, and three-colour block-making. Separate classes for line-etching, half-tone etching, fine-etching, mounting, and proving are also held, the syllabus being planned with full regard to the requirements of the trade. In the lithographic and collotype section the classes include practical instruction in these surface processes, whilst a further series of courses of instruction are for students of photogravure, mezzotint, and other intaglio methods. Particulars of the day classes, and of prizes, etc., offered to students, may be obtained from the syllabus, whilst it should be added that the Principal and his staff hold themselves at the disposal of intending students, who are advised to consult them in taking up a course of instruction. We may say that the litho classes are those which indicate the least response of the trades to the great advantages this school offers. There should certainly be a litho rally, and at once.

THE staff of the Photography and Printing Department of the Leeds Technical School (R. E. Barnett, B.Sc., head master) includes S. E. Bottomley, F.R.P.S., head of the department, J. R. Chadwick (compositors' lectures), E. P. Green (caseroom), L. C. Mennel and H. A. Littlewood (machinemen's work), and A. G. Simmons (process-work).

Besides the lecture courses in typography, provided separately for compositors and machinemen, and the practical classes in press and machinework and in ordinary hand composition, linotype instruction is now added to the curriculum. A Model 4 machine is being installed for this purpose by Linotype and Machinery Ltd.

In each of the two winter sessions since the opening of this newly equipped department in 1909 the attendance has included between 120 and 140 individual students, all of whom are employed in the printing and process houses of Leeds and district.

The letterpress department, equipped throughout by John Haddon & Co., is on a generous scale. The case room accommodates 18 compositors at a time, working at cabinets and frames of the best modern design. The four machines include the Art Caxton demy platen and the Babcock Standard drum cylinder machine. The process department has been equipped by Hunters Ltd.

The 16-page prospectus has been entirely set up in the school, and is not only artistic, but is distinguished by a clearness of arrangement which makes it very easy to comprehend. The seven illustrations of the classes at work are from flashlight negatives, which, with the blocks, have been produced in the department. Want of time prevented the machining and making-up being completed in the school. The brown cover, embossed in copper bronze with a title designed by the head master, harmonises well with the sepia matt art (Spalding & Hodge) on which the prospectus is printed, and does credit to Messrs. Chorley & Pickersgill, to whom the completion of the work was entrusted.

Brevities.

THE MANAGER of the sixpenny *Sydney Bulletin* is in England just now. His acquaintance should be very specially well worth the making, if only for any gleanings regarding the *Bulletin's* cartoons.

SOME recent patents include one for a method of applying a metalising liquid to electrotyping moulds and apparatus therefor, in the name of H. S. Levy, dated July 20, 1911, No. 16,689; one for a process for the production of relief printing blocks in the name of Bendixen, dated July 20, 1911, No. 16,695.

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THERE are close on 550 photo-engraving plants in the United States, 126 of which are on newspapers.

A NEW booklet has been produced by John Royle & Sons, Patterson, New Jersey, U.S.A., dealing with their routing cutters. They have tried to make it not only a book of reference for styles and prices, but also a helpfully suggestive manual for the cutter user. "The supply is large enough to go round," and there is a copy with their compliments for every user of a routing machine sufficiently interested in his work to send for it (Penrose's, agents).

A PLATE-MAKERS' ADVERTISING CONTRACT.—In the Lord Mayor's Court, before Sir Forrest Fulton, K.C., Recorder, and a jury, the Direct Photo Engraving Company Ltd. sued the Advertising World Publishing Company Ltd., York House, Norfolk Street, for £19 5s. 8d., for blocks supplied. The plaintiffs' case was that under an agreement they were to advertise, and the price was to be taken out in blocks. In March plaintiffs learned that the paper had changed hands. They then wrote stating that it was not their intention to continue the advertisements. Afterwards orders were received for blocks to the amount sued for. The plaintiffs had never agreed with the defendants to set-off the price of the blocks against advertisements. The prices charged were reasonable. The defendants counter-claimed for advertisements. The jury found for the plaintiffs on the claim and counter-claim. Leave to appeal was granted.

THE UNRIPENESS or other unfitness of paper is an old trouble in the press-room. Messrs. H. O. Strong & Sons Ltd., engineers to the printing and allied trades, of Norfolk Works, St. Paul's, Bristol, have brought out a new paper-curing machine. This is the sort of cure which is also a prevention. All printers will be aware of the trouble arising from creasing of the sheets, and most of them will know that this is due to the presence of moisture acted upon by variations in temperature when and where the paper is stored. It has therefore been found necessary to mature the paper in the temperature in which it is to be worked.

The machine is economical in the matter of floor space, and is made from 60 × 40 down. It is low in price, and it is suggested that it will pay for itself in a very short time. The machine is in operation in a Bristol printing office, and Messrs. Strong will be glad to show it under actual working conditions to any who may be interested.

GOOD WORK BY THE JAMAICA "GLEANER."—We have received and handled with much satisfaction a copy of that large paper the *Gleaner* of Jamaica. It is full of half-tone illustrations, and these are of very good quality. It would rank fairly well with that produced in large provincial papers at home, and it has to be borne in mind that the Colonial publisher has not a number of experts at hand to be called in upon any little thing going wrong. We heartily congratulate Mr. E. Theodore Brand, who has made these blocks in the *Gleaner* office, *i.e.* in its photo-engraving department; made them thus satisfactorily, despite his having been, so to speak, self-taught, and his being isolated from facilities available for engravers in England and America. No doubt he will advance and produce yet cleaner and more strongly contrasted illustrations as his experience develops, provided that his firm give him the advantage of really good ink. But how few will act as the *Belfast Evening Telegraph* does—pay a trifle more than the minimum for the ink so as to secure an exceptional result! May the *Gleaner* set us an example in this and other respects. We shall be glad to hear again from its office. The address is 148 Harbour Street, Kingstown, Jamaica.

A BRITISH-MADE REFLEX CAMERA.—Messrs. Walter Dockree & Co., Devonshire Works, Devonshire Road, Hackney, N.E., are making the new Celsus Reflex camera, British-made throughout, and which commends itself by several useful features. For "setting," one turn of the black ebonite head suffices. The focussing hood seems to be of the greatest height practicable for giving every aid in focussing without involving a needless fragment of material in the camera. It is so fitted to the eyes of the user that he sees the image on the focussing screen with greatest ease and clearness. Automatically it comes into position; and when not wanted its leather sides fold away into the top of the camera. If one reverses the hood the camera can be used at right angles to the subject. You can take a view holding the camera right over your head if you like. The camera has a long double extension; very helpful in a variety of landscape and architectural uses, not to speak of its being a help in portraiture. All external fittings are finished black, fired and hand polished. There is a self-capping focal-plane shutter. One winding knob controls all movements. The indicator of every speed is engraved around the winding knob. The pointer is engraved on the rotating-ring.

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THE HOLT ETCHING MACHINE is now offered to the trade by Messrs. Penrose, and it may be inspected either at their show-rooms in Farringdon Road, or at their stand in the Press Section of the Coronation Exhibition, Shepherd's Bush. Actual demonstrations can be arranged for by appointment.

The Holt is, it is claimed, essentially a machine for the house with a moderate output, seeking to satisfy their needs at a low cost; again, it serves as an auxiliary machine for copper work in the biggest houses, filling a hitherto unsatisfied want.

It is underborne and overarched by a strong iron frame occupying comparatively little floor space. Ball-bearings are utilised throughout. There are no metallic parts in contact with the etching acid, and every movement is instantly at the operator's control, A large number of plates can be placed in the tanks and etched simultaneously. The makers contend that no other machine will accommodate and satisfactorily etch so great a number of plates at one operation without fixing them down, or a single plate of the full capacity of the machine.

For many months Penroses, in conjunction with the inventor, have been at work perfecting, remodelling and wherever possible, simplifying the original model.

MR. HORGAN ON HAND COLOURING HALF-TONE POST CARDS.—Stencils and air-brushes are used, and an aniline colour is the medium of decoration. Procure three impressions of the half-tone cut on a heavy sheet of paper or thin cardboard. With a sharp knife cut out of sheet No. 1 all of the parts of the illustration that are to appear in colour. Take, for example, the sky and water portions of a cut. In sheet No. 2 the foliage would be cut out, and in the next sheet the outline of a building and such other parts as would appear in a similar colour. All of these stencils can now be dipped into melted paraffin, or may be soaked in castor oil to prevent absorption of the surplus colour during the process of spraying. The cards are placed in piles, and arranged in such a manner that the stencils can be placed in register with the cut and the air-brush passed over the opening in the stencil. As the ink is in a fine spray it dries rapidly, so the operator can make fairly good speed, and colour may follow colour rapidly. The greatest skill is required in making the stencils so as to mark out and lap for combinations of colours, such as producing a green by dipping a blue over a lemon yellow, or by combining blue, red and yellow, etc. If the cards are printed four-on and coloured this way, the work can be produced cheaper relatively, although the operator cannot handle the cards quite so readily as in gangs of two or three.

"HALF-TONE SIMPLIFIED," FOR AMATEURS.—The French publishers, Charles Mendel, have published a little book (60 centimes) called *La Photogravure simplifiée*, which describes in detail how an amateur can set to work to make line and half-tone blocks. The *British Journal of Photography*, noting the fact, says the formulæ given are all satisfactory and the operations are correctly described, though some of the expedients recommended would strike the professional expert as fantastic. Thus in order to avoid the expense of purchasing a cross-line screen and a special slide to hold it, the author recommends one should be made, among other means, by photographing a piece of tint in the sky of a large half-tone print! or to remove the film from one of the "Omnicolore" colour plates and enlarge the remaining screen! The process recommended for making the metal print is a similar one to Dr. Albert's cold-enamel method. The zinc is first coated with bitumen, then with the usual enamel, the print exposed and developed in the usual way, put into a hardening bath, slightly burned in, and then the bitumen removed by means of turpentine from the spaces between the dots. The publishers state that M. Tranchant, the author, is a conscientious experimenter who has tried all the manipulations that he recommends, and we have no doubt that this is so, but no examples are given of his results. What an inventor and experimenter himself thinks good enough, and which really may be quite remarkable considering the means employed, will often be very disappointing to everyone else, and our contemporary is afraid that few amateurs will get any satisfaction from attempting to make line and half-tone blocks without suitable equipment.

A NEW CAMERA.—Messrs. Tilley & Co. are now in possession of fine premises of three large floors at 62 Eagle Street, Southampton Row, just north of Holborn, and within about a hundred yards of Holborn Restaurant. Here we have had the opportunity of seeing a new camera which Mr. Tilley has devised, as the result of many years' experience and keen absorption in his special art. For many years he held a responsible position in the establishment of Messrs. Penrose & Co. There was absolutely no movement in this new camera; it was rigidity itself with, at the same time, the most perfect ease in movements. One noted in

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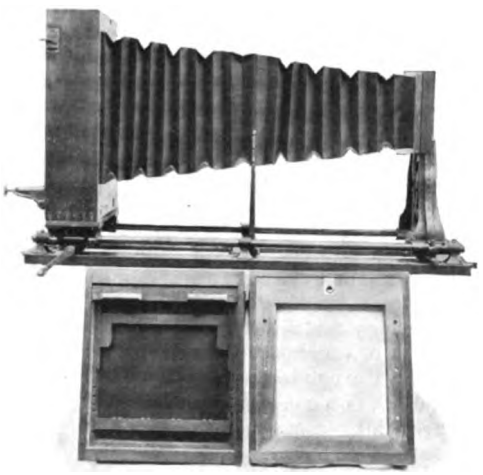
looking at the apparatus whereby the camera is locked (once the focus is obtained), that the "sleeves" are split, which amounts to a means of "taking up" any wear which might otherwise express itself in shakiness of the apparatus.

The solid metal front frame, of only half the original size, allows of the use of the conical bellows, and enables an arc light to be placed within six inches of the lens. Wooden fronts are constantly getting charred or warped. The back and front travel smoothly on solid one-inch steel rails. The sleeves travelling on the steel



The Perfecta Process Camera (Tilley & Co.).

rails are slotted and can be locked simultaneously in position when focussing has been adjusted. Messrs. Tilley & Co. issue an illustrated catalogue conveniently setting forth the points this Perfecta camera claims as improvements. In this Tilley Perfecta one turn of the focussing handle moves the body eight inches. Again, the operator's attention is entirely on the ground-glass. The focussing handle being attached to the underside of the back body, moves in the same direction as the ground-glass, and focussing can be adjusted to a thousandth of an inch. The Tilley (Perfecta) screen distance indicator enables the operator to bring his screen to focus, and by placing the indicating pointer back on scales (actuation being by a thumbscrew) the centre of screen of whatever thickness is shown. Wear of focussing screws, racks, and pinions is obviated by the use of a patent cable and grooved wheel focusser. When closed, there are only eleven inches from lens to ground-glass. We give one view of the camera showing the handle, the solid metal front frame, and the sleeves and steel rail and metal base.

DIFFICULTIES IN THREE-COLOUR WORK.—Suggested answers to the questions lately set in the City and Guilds Examination in Process Engraving have now been published by the *British Journal of Photography*. We reproduce one of these. A question was asked:—

"What are the chief difficulties to be met with in three-colour work, so far as the making of the negative is concerned?" Here is an answer:—

"The object of the three-colour process is to reproduce faithfully the coloured original, and this is the difficulty that comprises all others. To do this we have to take three negatives which are records of the correct colour regions only. This means that the filters and plates must be in absolutely correct adjustment for this purpose. Generally speaking, the photographer must make the best of the materials at his command, and they do not always fulfil all the requirements. The gradation of the three negatives must be alike in order that mixed colours are correctly rendered, and particularly greys. This means that the same sort of plate should be used for all three exposures (*i.e.* not only the same sort of plate, but from the same batch of manufacture), that the exposures are exact, and also in accurate ratio with each other, a condition that is by no means easy to fulfil. In order that the contrast may be the same in all three negatives the development must be the same for all, as regards time and temperature. Then the images of all three negatives must be of exactly the same size, so that they register correctly with each other, and very slight errors are sufficient to disturb this. Thus want of register may be caused if one of the plates is not correctly placed in the dark slide, if the camera is shifted slightly between or during the exposures, if the original warps under the heat of the lamps, or the apparatus expands or contracts. The lens also must give equal-sized images for all colours, and none of the filters must disturb the equality of size. The lighting of the copy must be the same both as regards quality and evenness throughout the three exposures; and as sometimes the exposures are very long, this also constitutes a difficulty. If all the conditions mentioned can be complied with, the chief difficulties will be overcome."

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"The Process Photogram."

THE PROCESS ENGRAVER'S MONTHLY
THE PROCESS PHOTOGRAM ESTABLISHED JAN 1894

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NOVEMBER 1911.

AND ELECTROTYPER'S AND STEREOTYPER'S REVIEW

What is Restriction of Trade?

We have not had to wait long before the public has been notified very fully of the effort being made by the duplicate platemakers to lift themselves out of the rut in which they have so long dragged out a rather miserable existence. One house has already notified its customers as to its own holding aloof from any combined effort of employers directed to the raising of rates, while it has also added that it has at the same time no alternative but to raise its own rates, as its men are union men, and the chairman of the men's union has intimated that work produced by any firm will not be handled by union men unless the revised and slightly increased price list is adhered to. We think the gentleman wrote this with a smile. We see in it a variant upon Artemus Ward's old joke, "You can't go into my show without paying; but you can pay without going in." This platemaker won't go in, but his customers are to pay; his prices also are up!

There is some general argument as to whether such an arrangement between employers and workmen can be considered as an action in restriction of trade. Upon that there are a few words which should be spoken, and spoken with plainness, for this is no time for finessing. The electro and the stereo are peculiarly articles whose output is not going to be very much affected by the question of price being a trifle more or a trifle less. A man ordinarily either wants an electro or he does not want it. If he does not, the most persuasive commercial traveller might as well keep his breath wherewith to cool his porridge. We cannot say quite the same regarding makers of original engraved plates. It is, however, as nearly a general truth regarding duplicating as any one thing can be affirmed to be in the business world. It follows, therefore, that the particular industry is peculiarly one not likely to be injuriously affected by any such action as that under notice. There may, however, be a very real and very effective restraint of trade due to unremunerative prices. And that is exactly what has been happening. Within the last dozen years (or approximately that term) quite a number of important houses serving the public in the character of duplicate platemakers have been restricted out of trade altogether in London alone. We do not like to mention the names here and now, in case some goodwill arrangements have given any other firms the right to use either of the names which are in our memory; and also we are restrained by a feeling of respect for some very hard and very reputable workers in our industry. But those who have watched things at all closely, know well that several houses who had been trading on the average for about thirty years, closed their doors, either doing this under compulsion or because their business, which,

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though it involved no little worry, had ceased to be remunerative under the then existing scale, was a business they were no longer willing to continue themselves, and at the same time could not sell.

This involved as an accompaniment another form of restriction. Just as we say in matters of vital statistics that a high death rate argues a low health rate among the living, so a high mortality among businesses argues among those which do not absolutely fall out of the running so unsatisfactory a general condition as is hardly compatible with keeping up of plant to concert pitch. That, again, in turn involves sooner or later various restrictions. The house sooner or later is slower than it would otherwise be in production of plates, and what plates it does turn out are not so sure and reliable as they would otherwise have been.

And think what that means. Printers can do something to help themselves as printers, if almost anything is wrong except the plate. We can mature our paper, doctor our ink, adjust our impression, soften or harden or dry our rollers, and of course we can change the workmen who are handling particular jobs, if we anticipate benefit from such change. But what can the printer do if his plate is poor? if it really does not contain the needful detail or is too shallow? And what can tend more certainly to the restriction of the printer's trade than his being ill served by his platemaker—served with plates of the kind which pile up expenses in his machine-room and without his being able to get, for a large total cost, anything like the satisfaction he would stand to get from a less cost, if only the plates were well made?

As a fact, printers commonly do realise that platemaking to-day is very different from what it was yesterday, and also that the platemaker has not been receiving his due. A very large printer, reputed to be one of the keenest bargainers in the craft, said to the writer: "We do not mind within reason what platemakers charge us, provided they all charge the same scale." He, of course, had in mind that ultimate employer of us all, the public, to whom the charge would be transferred.

We see nothing restrictive of trade in any objectionable sense in this concerted effort of capital and labour to combine their forces to remedy admitted and serious evils. We do see much that is entitled to the sympathy of all men habituated to broad views. Surely, too, the spectacle of capital and labour endeavouring to co-operate instead of merely flying at one another's throats, might make its appeal to the most dispassionate. The arrangement ought to succeed. It starts at a bad moment in some respects. There are rather more than the ordinary numbers of unemployed in duplicate trades, this being perhaps connected with the hours dispute, in which all printerdom was involved at the beginning of the year. That will do something to make the effort difficult. However, there are cool and clear-sighted men in the duplicating trades, and men who have felt the restriction of profits even to the disappearing point, at some times and in some cases of recent years. They are able managers and "bad to beat."

We watch the effort with great interest, although perhaps regretting that it has remained for the duplicating men to give a lead which it has long been in the natural province and in the fitness of things for the original engravers to give. We would say in ending what John Bright said about the American War of the sixties: "You may think the North will be beaten. Do not commit the crime of wishing it." The engraver who wishes to see the electrotypers fail will, it seems to us, be committing a crime of that sort.

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Death of Mr. J. Pulitzer.

THE career of Mr. Joseph Pulitzer, proprietor of the *New York World* (who died suddenly on October 29th, on board his private yacht off Charleston), was an extraordinary one—even for America. A Hungarian Jew, his first voyage to America was by means of an emigrant ship. On his arrival there, the story runs, he was not allowed to land because he had not got the requisite money, but being a good swimmer he dived overboard at night and swam ashore. Through the last year of the Civil War he served in one of the United States regiments. At one time Mr. Pulitzer served as a stoker in the Missouri ferry-boat. His genius for chess led him to intervene impetuously in a game at a small saloon in St. Louis between two first-class players, and to beat the best man in the club in a few moves. This attracted the attention of a German journalist, Pretorius, proprietor of the German *Westliche Post* at St. Louis. Within a few years Mr. Pulitzer had become managing editor and part proprietor of that newspaper. In 1878 he bought the *St. Louis Dispatch* and, amalgamating it with the *Post*, formed the *St. Louis Post-Dispatch*. Mr. Pulitzer then studied law and was admitted to practice. He was elected to the Missouri Legislature, although technically under age, and almost immediately became a national figure in Democratic politics. In 1883 Mr. Pulitzer bought the *New York World* from the late Jay Gould. He became a member of Congress shortly afterwards, and played a leading part in several Presidential elections. Within a few years Mr. Pulitzer revolutionised American journalism, introducing new methods of news-gathering, of publishing, of printing, and of illustrating. The immense development of the American Sunday newspaper is due to his enterprise. At the height of his success his sight gave way. Since then he restlessly travelled the world, blind and an invalid, but still retaining the control of his gigantic newspapers.

The funeral took place on 1st November, and was attended by a notable gathering of men distinguished in all walks of life.

When Joseph Pulitzer was taken to his burial, then for one five minutes all the myriad noise and bustle of the activities of the *New York World* office were still. Any presses which even at that moment had been rushing round were stopped. The motors were switched off. Every worker stood or sat where he was and did nothing. The very pen and pencil in the writers' and the artists' room were laid down, the studio was stilled. For just five minutes there was a serious and a solemn attempt at the interruption, the holding back and holding down, of all the forces of that otherwise incessant, erupting volcano. It was perhaps a unique homage to a man who had gone. But the creator of the vast modern illustrated paper, as America now knows it, was being laid to rest. The controller of the worldly destinies of thousands was advancing a new stage in his own destiny. The evoker of countless millions of hurrying movements on the part of the thousands his vast capital has variously employed, was himself being moved for once and only once more on the planet. Hence as tribute to the mighty captain of modern industry and the director, almost controller, of the thought and impulses of the swarming crowds of the great cities of the States, all the signs of life, though not the life itself, were hushed into cessation for five minutes.

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Talks with our Friends.

No. 2. DR. KENNETH MEES (Director of Wratten & Wainwright Ltd., Photographic Platemakers, of Croydon and Buda-Pest.)

I WENT to Croydon prepared for anything. My mind was hospitably open, or, shall I say, was panchromatically sensitive to any and every impression it might be its fate to encounter. At the same time I was conscious of some vague assurances regarding what was coming. Negatively, at any rate, I knew what to expect. For one afternoon I should be far removed from any region of sentiment. Nothing would be admitted —using the term to connote either introduction or assent—"except on business." In other words, a high, dry, scientific light was going to beat on everything I ventured to submit or to observe. Well—I was prepared for the worst, and to make the best of it. I was going as a man who for that occasion, at any rate, felt that he knew very little into the company of one who knew a great deal.

Well, now, I have gone. All is over except the—reporting. I have had some surprises. I have found that among the things I knew nothing about was Dr. Mees himself. Considered (in advance) as Dr. Dryasdust, he is a fraud. The beggar's human. He's full of such scientifically discreditable emotions as pride, a very high pride, in the engravers' and photographers' confidence reposed in Wratten & Wainwright's filters and flats and what not. Like our lakeland poet, "his heart leaps up when he beholds"—not "a rainbow in the sky," to be sure, but a very rainbow of costly coloured glasses which, because they have not quite stood the very last of most exigent tests, are going to the scrapheap for all the large amount they have cost the firm. Yet another emotion scientifically discreditable, but avowed implicitly at least by this "man of sentiment," as Laurence Sterne would have called him, is a certain delight that the old country heads the world in science.

It seems to come to that. "Lord Rayleigh, or Sir J. J. Thompson,"—he mentions the names of two great physicists, for instance, and invites you (or the universe) to name their foreign superiors.

I think, indeed, I'll lead off with just that pointer.

"Where Germany scores is that where we have one chemist she has ten; but my point is that the best of her ten is not better than the best British chemist. And when it comes to a distinct advancement of any science, it is not a question of how many men you have at work but of who is the best. There are only about five or six first-rate chemists in Great Britain, but there are not more in Germany. Making a whole lot of second-rate chemists may be good for industry because they are cheap, but it is not necessarily good for science itself."

It was to Sir Wm. Ramsay, one of the foremost English chemists, that Dr. Mees and Dr. Sheppard, as collaborators, dedicated the thesis which they elaborated when securing their doctorate and as a process in its attainment—a weird and fearsome book entitled *Investigations on the Theory of the Photographic Processes.*

I looked it over; beheld its symbolised formulations, which confront one not in single spies but in battalions, and I closed the book, or the nightmare, in the spirit of something more than Christian resigna-

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tion, sighing, "Agree with thine adversary quickly, whiles thou art in the way with him." And, by the way, Dr. Mees led off his book, if not with a text of Scripture, at least with a word from one of the Church Fathers, who was an Englishman to boot—William of Occam, an old friend of mine, for I've quoted him myself before now with much gusto. The Occam word prefacing this work is, "Neither more nor more onerous causes are to be assumed than are necessary to account for the phenomenon."

Nernst's name comes up as we talk of great scientists. His name, Dr. Mees declares, is certainly in the very front rank. That lamp of his, though, is not meant for the process trade, and is naturally, therefore, not serviceable in that field. (I thought of some engravers who rather ruefully came to that conclusion; had they read this earlier they would have spent some money differently.)

"In organic chemistry Germany is supreme, having spent money like water to make her position strong in that field." Dr. Mees mentioned the great name of Liebig among others.

At this stage I hazarded a "feeler" as to how he thought we might best seek to oust Germany from predominance in the chemical field.

"Why should we? Why should not one country be accepted as leading in some one sphere specially suited to its people or its conditions? Germany will be of no use to us unless she can continue to give us something better than we can provide for ourselves. We are ahead, for instance, in woollens; we send woollens to Germany. She's got to pay for them. She certainly doesn't and couldn't in any case pay in gold. If there isn't something she through her thorough organisation can supply which it is advantageous to us to take from her, how is she to pay at all? Which comes back to, how are we to trade with her at all?"

And Dr. Mees clearly does not think that a lot of self-contained countries like the United States represent the ideal. "The United States won't take anything they can avoid taking, and they naturally don't export much."

But I got on to personal and particular questions. What was this business his firm was undertaking abroad?

"We are taking over the old business of the Erste Ungarischen Photo Industrie, A.G., Buda-Pest. The business had latterly belonged to an important Buda-Pest bank. Before long we hope to be carrying on this business in a modern plate-works of the latest design. The new factory will be close to Buda-Pest. What we intend to do there is to supply the ordinary plate for the commercial market—both for the professional photographer and the amateur. We don't propose to supply from that factory the red sensitive plate nor the filters, nor at present to do any particular process trade."

British photographic platemakers, I learnt in our talk, had not done so very badly in that market even so far; despite the duty, which, being reckoned by weight, is heavy, because 15 × 12's and their varied sized companions are heavy.

Pursued for details with as near an approach to inquisitiveness as the modesty of journalism would permit, Dr. Mees explained:—

"The bank took over the business at the request of the Hungarian Government, which is extremely anxious to develop manufactures in a country almost wholly agricultural. I may say that we have the assistance in the works of a perfectly efficient platemaker, a Hungarian. We don't want to make any needless personal changes; we shall have our hands full for

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a time designing works and training men as may be necessary—we've a fine staff here in Croydon—and generally getting the new operations under way, and looking after things personally at short intervals. Mr Wratten is over there at this moment."

"Well, here's to the new factory! I feel I could almost drink to its jolly good health in a good draught of, say, collodion emulsion."

"That wouldn't do at all. Most inappropriate; considering that our business was started largely on the strength of the efficiency of the gelatine dry plate as against the collodion methods. Mr. F. C. L. Wratten was the prophet of the gelatine dry-plate era. Our Wratten ordinary green label of 1877 was our first great important line; and in 1878 Mr Wratten followed up this with the Instantaneous plate, which has been our standard plate ever since. We even keep the same label; we daren't alter it; even labels become sacrosanct when people look for them. The labels stick to us, and we stick to our labels. I may say, following this little retrospect, that we pretty soon got a great trade in the tropics. In fact, we hold the tropical market almost unchallenged with our Instantaneous plates."

Yes; and I may interpolate on my honour as a raconteur that when a Colman's traveller, working, alas! too far inland from Zanzibar, was invited to dinner and uttered his faithful and heroic plea to the cannibals, "Eat me, gentlemen, *with Colman's mustard*," he also, by their grace, first snapped them—as he quiveringly told them—"with a Wratten."

"We are, of course, making a good number of panchromatic process plates, and many X-ray plates. Our colour-filter department is a very specialised business."

"What of your dyes?"

"Nearly all are Continental," Dr. Mees replied; and by natural transition from talk of dyes, we soon were speaking of the development of the colour-sensitive plates which followed soon after Dr. Mees' own entrance into the business in 1906. He did not, of course, labour any personal factor; but he simply stated the incidents of business development just as he would state some quite unemotional reaction or rule of arithmetic. It seems that from 1906 onwards the Wratten & Wainwright laboratory—that unpaid College of Research—has been the pivot of the whole works.

What a thing that laboratory is! I couldn't tell the truth about it, and I couldn't tell a lie about it; for any mortal thing I liked to write about it would be true and untrue. For instance, it is a constant begetter of life; and it is the destroyer of life *par*—I suppose I must say *par excellence*. Of the new potencies it yields to its patient workers, of the new planets that swim into their ken, they only really pursue a very few. They only put on the market a very small percentage. They only bother, that is to say, with things they believe will sell. Poppies in a few generations would cover the earth, says Darwin, if every seed in its turn became a flower; and if all the Wratten & Wainwright laboratory discoveries were being bought and sold, there would by now be very many more Wratten customers in the world than there would be inhabitants. Natural selection saves the world from being over-populated, and a sort of natural selection saves us from having too many Croydon specialities. The firm prove all things, and hold fast to that which is good—"biz."

A break in the talk; Dr. Noel Mees conferring upon some letter answering a technical inquiry. It appears that the Wratten & Wainwright business is quite a college of research.

(To be concluded.)

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The Duplicating Houses and their Latest Move.

THE intimate connection between the crafts of the process engraver and of the electrotyper and stereotyper makes any move on the part of either of them a matter of vital interest to the other. The interests of the process engraver are bound up with the prosperity and wellbeing of the sister trade, while the business of the electrotyper tends more and more to be practically dependent upon the process engraver. Consequently the movement in the duplicating houses towards securing better prices will be watched with deepening interest as time goes on.

It is too early yet to say what the outcome will be, but there seems every reason why the present movement should prove successful. Hitherto the masters' and men's unions have been working on independent lines. Now, for the first time, they have met together with the object of devising a plan by which prices may be raised and replaced at the higher figure. If both masters and men are faithful to the agreement entered into, there seems to be a fair prospect of maintaining such a standard as is now agreed upon.

For many years past unsuccessful efforts have been made to better the position of the electrotyping houses; prices have been raised again and again, some to fall to the old level or even lower still. Where lies the fault for the collapse it is difficult to determine; but one thing seems certain: that few, if any, of the houses have been making headway. Some have found themselves compelled to reduce their capital, others have given up the struggle and have gone out of business altogether. Whether this has been the outcome of bad organisation or of too low prices may be an open question, but it seems strange that the trades so intimately associated with the pictorial side of our literature should be in such a chronic state of impoverishment. It does not reflect much credit upon either the process engraver or the electrotyper and stereotyper that they should always be crying out about bad prices.

The enormous quantity of illustration now used in the literature and advertising of the day surely places in the hands of these trades the means of making a respectable position for themselves in the business world, and the sooner they rise to the possibilities of the situation the better it will be, not only for their own comfort, but for the whole of the interests involved.

We have but little sympathy with agreements that make for restriction of trade, nor for those that merely bolster up a decaying business; but agreements that leave houses and men free to secure to themselves the benefits of their individual initiative, and that secure a fair share of profit to both masters and men, are to be welcomed. Whether the latest move on the part of the duplicating houses will secure this, remains to be seen.

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Practical Hints on Copying.

By F. W. Plews.

THE process of copying seems to present formidable difficulties to many photographers, both old and young. In this article I intend to discuss some of the reasons why this is the case.

In the first place, a good rectilinear lens, or, better still, one of the modern anastigmatic lenses, is necessary for the production of a good copy, particularly so if our copy possesses many straight lines, such as an architectural subject would have, or a plan, etc. A single lens would be entirely out of the question for such work. The disadvantages of such a lens would be at once apparent in the barrel-shaped distortion and the necessity of using a much slower working aperture.

A little piece of apparatus which facilitates the production of a copy is a stand similar to fig. 1, and can be made by anyone whose fingers are not all thumbs. It simply consists of a flat board A, fig. 1, upon which is laid two long pieces of wood, B B, parallel. The two portions C C are grooved pieces of wood which may be obtained from any picture-frame dealer. D is the sliding copyboard, and consists of a piece of flat board, at the back of which is fastened another board, E E, a little larger, to form the tongue which slides along the groove. The manner in which it slides is shown by the dotted lines F between the rails B B. I have a box in which I place the little oddments, such as drawing-pins, pincers, stops, etc. G shows the form of this box, at the bottom of which there is a piece of wood just the width of the space between the two rails B B. The dotted lines H show the box in position, and in focussing you push the box up and down the rails until you have got the exact position for the size of copy you require. The black dot I upon the top of the box represents the hole through which the screw is put to secure the camera on the box.

This forms a very handy apparatus for all kinds of copying, and also for lantern-slide making, by making a carrier to take the place of the copyboard, and covering the space up between the carrier and camera, when using it for that purpose, with a focussing cloth.

J J are the hat-pins upon which is suspended the magnesium wire, and must be so shaded that the light is not allowed to strike the lens. The lighting must be arranged so as to avoid reflections and to show the least possible amount of grain in the copy. In this connection, remember, the angle of reflection is equal to the angle of incidence.

Let us now suppose we wish to make a copy from a faded photograph. The first thing to do would be to pin up the copy on the board exactly opposite the centre of the lens. Now focus to the size required. Here the advantage of the sliding arrangement will be at once apparent. The next, and one of the most important considerations, will be what kind of plate to employ. The copy is a faded one, I am supposing; that means to say, the once rich tones of our print have turned to a yellowish colour and some of the tones seem to have disappeared entirely. "A little knowledge is a dangerous thing," we have often heard quoted, and it seems very applicable to the case in point. The young photographer has listened to lectures on the

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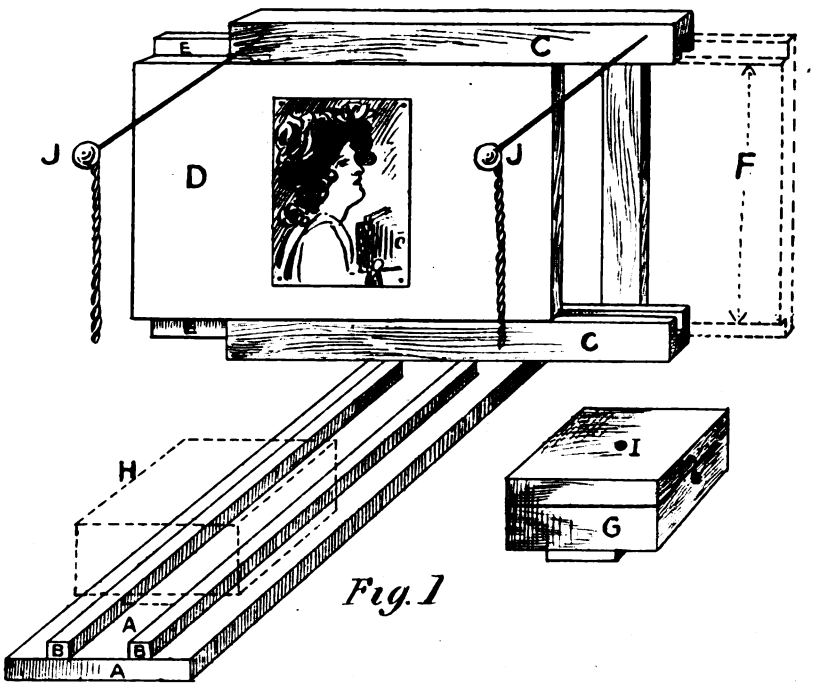

Fig. 1

subject of orthochromatic photography, and has gleaned the information that it was most advisable to use a yellow light-filter in conjunction with an orthochromatic plate when taking pictures or other objects where the yellows and browns predominated. This is correct so far, but it needs qualifying. Now he puts his little bit of knowledge into practice, using the yellow filter and ortho plate to copy his faded photo, and can one wonder that the Answers and Queries column in his favourite photographic journal contains his result and he seeks information on the subject? He has done the reverse of that which he should have done, and the result upon his plate is *nil*. He blames his developer, plates, in fact everything but the right thing, namely, his lack of knowledge.

The colour photographer has many times been ridiculed, but I may state that the theory of light and colour is absolutely necessary to the man who wishes to get the most from his hobby of photography; it places a power in his hands which will enable him to deal successfully with anything he may be called upon to do.

Now let me explain briefly where our tyro went wrong in his attempt to copy under the above conditions.

The yellow filter allows the yellow tones of the faded photograph to pass unobstructed, and the plate being also sensitive to yellow is acted upon by those tones, the result being a poor, flat negative lacking in tone. Now if he had used an ordinary plate which is insensitive to yellow, and had used it in conjunction with a blue filter, or even without a filter at all, he would have obtained a much better result than the copy appeared to be capable of giving. The explanation of the above is that the faded photograph

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possesses tones which are only faintly visible to the eye, but (being non-actinic) when one uses an ordinary plate they do not take the pure whites of the copy only impressing or acting upon the plate. Consequently the faded tones will come out clear glass in the deepest tones, with varying degrees of tone in other parts according to the light and shade the original possessed in the earlier stages of its existence.

To sum the whole matter up. The visual and chemical portions of the spectrum do not lie in the same part: that portion of the spectrum which to the eye is the darkest, namely, the blue region, photographically speaking, is the lightest when using an ordinary plate; and that portion which to the eye appears the lightest, namely, in the D region or near the sodium line or yellow portion of the spectrum, photographically speaking, is the darkest when using the ordinary plate.

In fact, it is really wonderful that such good results have been made in taking landscapes, etc., when using the ordinary plate for that purpose.

We have now unlimited choice in plates to suit any particular purpose, but to make the correct use of them we must possess sufficient knowledge of the use of the various light-filters and the proper plate to use in conjunction with the same, before we may say our education is completed even for the ordinary branches of work which an amateur may be called upon to do. Another case which the beginner is at sea with is to copy a blue print. Now for this purpose let him obtain a red light-filter and a Lumière B or C or a Gem Tri-col. plate. Of course the illumination of the dark room must now be in accordance with the requirements of the sensitive plate we are using. We shall for the above plates require a red and green glass placed together in our lamp, and this will be a safe-light. Development is done with the dish covered up, and metol, one solution developer, or a mixture of hydrokinone and metol, may be used according to the character of the negative required, remembering that metol gives softness and hydrokinone gives hard negatives, and the mixture will accommodate the operator to the extent desired.

I have purposely left out any technical reference to the spectrum, and endeavoured to put the matter so that the beginner will not be confused.

Now suppose we have a black-and-white line subject to copy, our choice of plate must be one which will give us a very dense deposit on that portion which represents the whites of our original, and clear glass representing the black lines of the same. Such properties are possessed by Ilford, Mawson, and Imperial process plates, all of which I have tried successfully, and should be backed. The developer must be a strong hydrokinone one; a very suitable formulæ is the following:—

No. 1.

Hydrokinone - - -	160 grains.
Soda sulphite - -	2 ounces.
Water to - - -	20 ,,

No. 2.

Sodium hydrate - -	80 grains.
Potass bromide - -	30 ,,
Water to - - -	20 ounces.

Take one ounce of No. 1 and 2, and dilute with one ounce of water.

Pin up the copy and focus, then insert a suitable stop, say about *f*/16, perhaps a more open aperture would do if the lens is a very good modern anastigmatic one. The exposure may be made by burning a few inches of magnesium ribbon or wire, and do not allow any light to pass through

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the lens except that which is reflected from the copy. If we use wire, a very good way is to twist the amount of wire required for the exposure and allow it to hang down the whole length of the copy, suspended from hat-pins in the manner shown in the illustration, fig. 1, J J. The wire when lighted gives an equal illumination on each side of copy.

After exposure we may proceed to develop by taking the amount of developer required, and allow it to act until we have obtained all the density we can get without veiling the lines. My method is to develop until I can see the image very strong at the back of the plate, wash and fix in the usual way. If the negative is clear in the lines and dense in the whites it will not be necessary to follow up by intensification, but suppose it to be rather thin, we may intensify it with mercury and ammonia.

Formulæ.—Mercury bichloride 3 ounces, ammonium chloride 2 ounces, water 80 ounces, having previously cleared any veil which may have covered the lines, which should be clear glass, by a very careful immersion in the following bath. A few drops of a 10 per cent. solution of ferricyanide of potassium placed in a solution of half ounce of hypo, water 5 ounces. Watch the reduction very carefully, and when it is judged to be sufficient, wash it well for at least ten minutes in running water and place in the above mercury bath until bleached white through to the back; wash again for five minutes and blacken with ammonia (·880) 3 ounces, water 80 ounces.

The negative should not be left in the ammonia any longer than it takes to complete the blackening operation; wash again for two or three minutes, and dry off; this completes the operation.

I generally follow the development up by this treatment, and my negatives possess the appearance of a wet-plate negative. Any person wishing to make negatives from line subjects, etc., for making photo-transfers may adopt this method as an alternative one to the wet-plate method with every confidence.

The Polychromide System at the Dover Street Studios.

MR. HAMBURGER sends us this interesting communication regarding the Polychromide system in operation at the Dover Street Studios: "My attention has been called to a very kind mention of the Dover Street Studios in your October issue, but would wish to correct a small inaccuracy in description of our printing from transparency plates.

"The Polychromide system, which has been perfected by us, does not depend at all upon collotype or any similar process for paper reproductions in natural colour. The process consists of the following features, which are now perfected and in practical working:—

"First, a powerful artificial light which enables us to get exposures in $\frac{1}{100}$ of a second. Second, a camera which makes four colour negatives at one exposure ready for the blockmaker or for our own direct printing, which is done, in the case of small orders for private customers, on bromide paper, by a process (patent for which has just been filed) which depends upon the chemical change of the silver salts into the colour required."

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The American Process Engraver at Work.

THE copy of the *Photo-Engraver's Bulletin*, the organ of the American Process Engravers' Association, recently to hand, brings us news that may well gladden the heart of every process worker throughout the world.

Just here we congratulate our American friends upon the journal before us; it certainly does them, and the trade they represent, the utmost credit, not only for its intrinsic value, but for its "get up" and for the spirit animating it throughout.

With them the process engraver is not the poor, downtrodden individual he is so often depicted in this country. Just the reverse. He is the great outstanding figure in the van of all business enterprise.

Here in the very forefront—the front cover—we have the clue to the spirit that animates the whole. The process engraver looms large, intellectual, with plenty of self-reliance and ready for every emergency, while at his feet and literally "looking up to him" are the merchant, the financier, the contractor, the mercantile marine, the engineer, and the professional.

On another page you have this little lesson in self-confidence:—

"How do you say it?"

"I'm an *Engraver*," or

"I'm an **Engraver!**"

And the whole is wound up with the moral, "You are just as good as you think you are—but no better."

Surely here is confidence enough to carry any enterprise to the very forefront of the business world!

So much for the get-up of the issue. But what is the message it brings that will justify our opening remarks?

The message is simply this. That while the American process engraver has been for years past in a similar serious plight to that in which his English *confrère* is supposed still to be, he has now worked out his own salvation and has found the road to success.

Having come to the conclusion that a new era was dawning, the trade held a two days' convention in Cincinnati, which turned out to be the greatest convention of process workers ever held.

As a summary of the proceedings and a statement of the immediate outlook, we cannot do better than reproduce the words of the newly elected President, reported in the issue before us:—

"The Convention is over, the excitement has subsided, and we now face the serious problem of organisation. . . . We have

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cleared the site, and the actual building of our organisational structure commences.

"The Cincinnati Convention, with its 180 delegates and visitors, was the greatest get-together movement in the history of photo-engraving. It is in line with the modern spirit of co-operation, organisation, or whatever it is that is drawing men in the same industrial pursuits closer to one another. We are beginning to learn that co-operation is superior to competition, that harmony is better than discord.

"When I viewed the gathering in Cincinnati, I could not help but say, 'These men are here for a purpose.' I set out to learn what that purpose was. It was apparent from the outset that they came to the Convention to DO SOMETHING. They had never supported the International Association of Photo-Engravers as it deserved; therefore, if it did not accomplish all they desired, they had no one to blame but themselves. If they were dissatisfied with the state of affairs, they must have been dissatisfied with their own part in it. If the International Association was weak, it was due to the weakness of its members. If when the International Association asked them for funds, they gave excuses instead, they could hardly expect touring cars in return.

"It's a pet saying of mine that no one ever got more out of anything than he put into it, and the case in view proves it.

"I believe the foregoing is sufficient for the theoretical side of the question. Let us then approach its practical side. I know from my experience in Chicago and the Middle West that the results of organisational efforts are far-reaching indeed.

"The Chicago Photo-Engravers' Club has paid its members handsome dividends and contributed greatly to their financial, moral, and mental welfare. It has cost time, labour, and money, but it was well worth the expenditure of all three. We have saved money in the purchase of materials, we have saved money in refusing advertising hold-ups, we have saved money by learning something of our cost of production and in avoiding unprofitable work. We have succeeded in replacing costly competition with friendly rivalry based upon close acquaintance. All these things have we done, and more. We have extended the scope of our efforts to take in the territory surrounding Chicago for five hundred miles, and while that part of our local movement is in its infancy, it is extremely promising.

"What we have done in Chicago can be done in every city in the United States and Canada. With your assistance it WILL be done.

"While I said in the beginning that the Executive Committee's work had been somewhat delayed, it must not be inferred that we have been idle. We have defined the policy for the *Photo-Engravers' Bulletin*. This number is merely an indication of what we intend and expect to accomplish with it. We have appointed the following committees: Ways and Means, seven members; Organisation, twelve members; Publicity, seven members. Work has been mapped out for all of them. More work will be outlined, and from all indications it will be cheerfully performed. My office is deluged with letters from members all over the country, offering suggestions, asking for assistance and information, and all expressing confidence in the future of the I.A.P.E.

"Although this is merely the beginning of our programme, I am highly gratified at the opportunity to report a new local organisation — namely, the Cincinnati Photo-Engravers' Club. It was my good

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fortune and privilege to visit Cincinnati July 26, to present the members of the Convention Committee with ten loving-cups, donated by the delegates and visitors to the Convention. The Cincinnati engravers had been in an unorganised state for some time, and had formed a temporary organisation for the purpose of administering to the wants of the Convention and the comforts of those in attendance. During the meeting at which the loving-cups were presented, it was decided to form a permanent organisation, and it was effected then and there. Officers have been elected, a constitution is being drafted for adoption, and a grand start has been made. I hope to report more news of this nature from now on.

"I received a letter from Mr. H. G. Grelle, of New Orleans, who informs me that the Southern engravers will hold a conference in that city. He asks assistance from the International Association in the shape of attendance of one of its officers, and financial aid to make the conference a success. That's the sort of organising work we have in mind.

£400 WAS SUBSCRIBED.

"It was made clear at the Convention that a vigorous campaign, and one likely to prove beneficial to us all, would require funds to put it into effect. We need money to accomplish our purpose. The dues prescribed by our Constitution wi l just about pay for postage. All of this was explained at Cincinnati, and you who were there remember the generous offers made by men on the floor of the Convention. The other day, at an informal dinner in Chicago, at which ten local engravers were present, two thousand dollars was pledged. At present I am personally advancing money and devoting time and clerical help to further the work. The proposition is plain—How much will you give?

"Think this matter over carefully, view it in its right light, regard your contribution as an investment, and send your check, money order, or draft. We are under heavy expense right now. Your immediate attention to this important item means a great deal."

THE BRITISH PARALLEL.

The parallel between the American and English process engraver is so striking that one instinctively asks, Why cannot we emulate our American brethren? For years we have been trying to do something, but so far little has been accomplished. Let us catch the enthusiasm that comes from across the water and make the ensuing year memorable in the annals of the British process engraver!

One of the chief points of discussion at the Convention was that of costing. Mr. Robert S. Denham, who has given so much time and thought to the subject, gave the result of his investigations. The following are a few of the points he made:—

"The man who would prefer to work in the dark rather than in the light would be open to suspicion as a lunatic, yet there are hundreds of men in this country who pose as business men, who refuse to believe the truth about cost of production when it is plainly presented and demonstrated by those who have learned the advantages of knowing the value of each item produced in their plants.

"There are three general classes of excuses given by these men for their failure to take advantage of their opportunity for learning to determine cost:—

"First. *They believe that the difference in conditions between their plants and others makes it impractical to find cost by a similar method.* This has about as much founda-

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tion as the theory that the rules of multiplication would not apply to $2 \times 4 \times 15$ exactly as well as to $9 \times 9 \times 9$ because the factors were different.

"Second. *The product must be sold at prices which are already established, so it is useless to ascertain the cost.* The varying prices at which the product is offered and sold, prove that prices are not established. A knowledge of cost will do more than anything else to establish prices, and they will then be placed on a profit-producing basis.

"Third. *They believe that the old method of accounting is satisfactory because it showed a profit at the end of the year,* although many important items of expense, such as depreciation, interest, and often salary, were omitted, and no information was furnished regarding cost of each individual order. The truth might frighten them into letting their less progressive competitors take the losing orders.

"Of the many advantages of knowing cost the following seem to be of the most importance:

"1. Provides basis for profitable selling.

"2. Gives you confidence in fairness of your selling prices.

"3. Profit or loss on each order a known amount.

"4. Prevents duplication of orders at unprofitable prices.

"5. Creates confidence and good-will of ustomers.

"6. Encourages friendly spirit among competitors.

"7. Indicates which classes of orders to avoid as unprofitable.

"8. Indicates which classes of orders to encourage for profit.

"9. Indicates relative profitableness of each salesman's orders.

"10. Indicates how low it is safe to bid in an emergency without loss.

"The man who, knowing the cost of his product, uses that knowledge as a basis for his selling prices, is in a position to become independent within a few years. He need not operate a large plant, nor do what would be considered a large volume of business, to get the most gratifying results.

"*Cost* is the sum total of all expenses required by the business, including salaries, interest on investment, depreciation and many other items commonly omitted in the effort to show that an unprofitable business has made money.

"*Profit* is what can be drawn out of the business and put into income-bearing securities or other investments, without interfering with the operation of the business, after the owner's salary has been paid, as well as provision made for the maintenance of the plant as good as new, and interest paid upon their investment to those financially interested in the business.

"When a scientific method of finding cost has been applied to a business, such as that of manufacturing photo-engravings, there is a distinct line drawn on each order between *loss* and *profit*. That line is at the point which represents *cost*.

"The theory that there was a relation between the area of the face of a cut and its value is another of the relics of the 'rule-o'-thumb' methods which are rapidly being abandoned.

"The work of keeping the records can be accomplished by one clerk in a photo-engraving plant employing eighty to one hundred shop employees.

"The cost of keeping the records is insignificant in comparison with the advantages derived, as plants, operated at a profit, frequently report that the use of the system has doubled the profits, which

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is equal to doubling the output at the old prices, a condition which would involve much additional investment and careful supervision.

"There is no mystery about the science of cost-finding. Any intelligent office clerk can keep the routine work up after having been properly instructed. The monthly summary of cost should be made by someone familiar with all of the expenditures of the business, preferably the accountant.

"The present is the most hopeful time in the history of manufacture, for not only has the producer all of the advantages of mechanical ingenuity which this inventive age has developed, but he is in a position to apply exact science to the determining of the cost, and consequently the value of his product.

"This knowledge enables him to get a price for his product that will yield a profit, and will further enable him with his competitors through their organisations to establish market prices for their product upon a basis which will relieve them of the anxiety, annoyance, and loss with which the ignorance of past decades has burdened them."

One of the most remarkable features of the Convention was the standing vote on the method of measuring the blocks. Mr. Benedict was down on the programme for a talk on block measurement, and went at once to the very heart of his subject. In the course of his address he said:—

"The best reason I can give you for charging block measure is that we have never sold half-tones any other way, and we were one of the first to make half-tones in Chicago. I do not know how many photo-engravers sell their half-tones by what they call 'face measure'—that is, measure the proof,—and I should like, before saying anything more about that, to find out how many delegates here are selling half-tones face measure.

"PRESIDENT STILES. — Mr. Benedict wants to know how many are selling half-tones face measure. Will those gentlemen stand? [No one rises.] I am surprised. The question is as to face measure against block measure. We are trying to find out how many are selling by that old, fossil method of face measure.

"A VOICE.—We are selling about five per cent. of our products face measure.

"PRESIDENT STILES.—Do I understand that all present are selling by block measure? Those who are selling by block measure will please rise. [All rise.] If anybody asks me again what the Association did, I am going to tell them about that vote; that is one of the finest things I ever saw, and I am greatly surprised.

"MR. BENEDICT.—I will now say what I intended to. Some customer will object to a charge of twenty-two inches on a cut and will take a rule and measure it, and say you have overcharged him for two inches; he being a good mathematican and having a good standard rule, has found you have added two inches to the size of the cut. As a matter of fact, I do not believe there is a photo-engraver who sells over seventy-five per cent. of the copper that he buys. If any customer objects to paying you block measure, this is the best argument I know of that you can get to show that it is fair. The bevel on the average half-tone amounts to ten per cent.; say the average size is about eighteen square inches, and you add a quarter of an inch, that is, the one-eighth of an inch all round, and it increases the number of inches about ten per cent. Even then about ten per cent. of the copper you buy goes into the scrap. Our half-tones are all measured on the scale.

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I presume you all know what that is. Here is the thing, got up a long time ago. I presume most of the photo-engravers have these things now. It tells you the exact number of inches in the cut beyond question of a doubt."

We are at one with President Stiles. We, like him, are "greatly surprised," and consider that should the American Association do nothing else, it has earned the lasting gratitude of its members. May the engravers of this country rise to their opportunity!

We shall follow the progress of this Association and its monthly organ with a great deal of sympathetic attention.

Humidity as a Cure for Electricity in Paper.

If a small strip of paper be warmed and then drawn several times between the arm (pressed against the side) and the body, static electricity will be found to be generated and the paper will adhere to the wall if placed against it. The same sort of thing occurs on web presses, in which the friction of the paper gliding rapidly over the rolls has the effect of increasing the charge of static electricity in the rolls, until attraction for the paper becomes sufficient even to tear it, with the result that the operation of the presses is handicapped, under certain weather conditions.

Proceeding on the principle that humid weather is unfavourable for the accumulation of electricity on the press rolls, it has been reasoned by two American engineers (Mr. J. C. Parker and Mr. W. H. Lines, of the Rochester Railway and Lighting Co.) that if moisture, even in minute quantities, could be supplied in the immediate vicinity of the rolls, it would counteract the tendency to electrical generation.

After some further experimenting, what is in effect a small metal trough was built, in length the same as the roll it is designed to protect, and placed parallel with the roll. Into either end of the trough a small electric heater was inserted and the trough filled with water.

It is scarcely more than a matter of seconds before the water is raised to a temperature where vapour rises from it freely. In short, the proper degree of humidity is supplied.

Messrs. Mann's Triumph at Turin.

The great exhibition at Turin has practically run its course, its closing day occurring at a time of national strife with another country, but the exhibition itself has also been a battlefield of a more civilised character — the strife of nations for commercial supremacy. There were ranged the products and the means of production from all the great houses of the civilised world, and not a little space of the great show has been occupied by machine makers in the printing trade. The competition for first place amongst both printers and printers' engineers has been a keen one. Of this class of exhibitors there were many, and it is gratifying to know that Messrs. George Mann & Co. Ltd., of Leeds, secured the Grand Prix for their lithographic machinery, which included their patent two-colour rotary offset, single-colour rotary offset, rotary tin-printing machine, etc.

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How Process Workers might Protect their Sight.

THERE is quite a pathetic note in the *Inland Printer* of America, the occasion of which was an alarmist inquiry by a night worker:—"Since I have been working on the night shift, I find my eyes are going back on me. I write to know if you hear of others working with arc lights having the same trouble. If so, I am going to give up my job."

No wonder that question stirred the expert to whom it was addressed and impelled him to give the most helpful reply in his power; for we find him prefacing his words with the rueful reminiscence that he had ruined his own eyes irreparably by working for four years at night in a room with enclosed arc lights. These lamps were the first of the enclosed arc type introduced, and were a great improvement on account of the ultra-violet rays they produced, but it was not known at that time they were so injurious to the sight. Prof. F. Terrien of the University of Paris says that these injurious ultra-violet rays can be completely shut out by adding a solution of esculin to a five per cent. gelatine solution. You coat glass with it, and when it is dry cover it with another glass. An optician could easily make this esculin-coated glass into spectacles and thus protect one of the greatest blessings in the world—good eyesight. Apropos we may mention that Dr. Ernest Maddox, the famous oculist of Edinburgh and Bournemouth, has given somewhat special attention to the peculiar dangers to eyesight incidental to the pursuit of printing, using that term in its largest comprehension as including engraving. We believe some short monographs on this particular topic are extant, and we cannot think of any data or counsels with which it would be more advisable for all parties who are actively engaged in our craft to familiarise themselves.

BLACK AND WHITE PUBLISHING CO. LTD.—At a meeting of the Company held at London on October 30th, the following resolution was passed:—"That it has been proved to the satisfaction of this meeting that the Company cannot, by reason of its liabilities, continue its business, and that it is advisable to wind up the same, and accordingly that the Company be wound up voluntarily; and that Mr. Arthur H. Randall, of London, E.C., be appointed liquidator for the purposes of such winding-up." Notice is given that a meeting of the Company will be held at London on November 15th.

RARE BOOKS AND—QUERY—RARE BOOKINGS.—More than 1200 books of the highest value, forming a portion of the great Huth Library, have been due to pass under the hammer during an eight-day sale at Sotheby's in November. Formed by Henry Huth, the well-known bibliophile and antiquary, and the bearer of a name long known and respected in the City, the library was famous thirty years ago for its beautiful illuminated and rare specimens of early printed books. It has been valued at many thousands of pounds, but the intervention of the American collector in the book market, which has been such a prominent feature at recent sales, makes it impossible to guess what such a collection will realise at auction. Shakespeare, of course, is well represented. Many curious editions of the Bible, too, have their attractions for certain collectors. There are beautiful old manuscript copies of the Latin Vulgate, some of them exquisitely illuminated, and numerous printed versions in various languages.

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Hours and Wages of Electrotypers and Stereotypers.

An agreement as to hours, wages, and other matters was entered into on September 22nd, 1911, between the Electrotypers and Stereotypers' Trade Protection Association and the London Branch of the Federated Society of Electrotypers and Stereotypers of Great Britain and Ireland. The agreement is to operate for five years from November 1st, 1911, but is, in certain contingencies, terminable before the expiration of that period by three months' notice on either side.

The working week is to be one of 50 hours, subject to any reduction that may be generally adopted by the printing and allied trades. The recognised hours are to be from 8 a.m. to 6 p.m. on the first five working days of the week, and from 8 a.m. to 1 p.m. on Saturdays, any time beyond this to be subject to overtime rates.

The minimum wage for members of the Society is to be 44s. a week; all public holidays to be paid for, and in addition overtime rates to be paid to members employed on such holidays. In addition to public holidays, all members of the Society who have been in the employment of one or more members of the Association for one year from November 1st, 1911, are entitled to one week's holiday each year at full pay.

All members of the Society are to receive an immediate increase of 4s. a week on November 1st, 1911, whatever their present wages may be, and it is expressly stated that the minimum wage of 44s. is not intended or desired to be the prevalent wage for members of the Society.

The Association further agrees to abide by the rules of the Society as existing at March 1st, 1911, or as subsequently altered by mutual agreement.

The Society on its part agrees to "uphold, maintain, and sustain by every means in its power the scale of prices and discounts adopted by the Association, and especially binds itself to withdraw its members from any electrotyping or stereotyping firm or company dealing in the products of the members of the Society at prices below those adopted by the Association, always provided that reasonable proof of such under-selling is adduced by the Association to the Committee of the Society, and that the house so complained of can properly be described as a trade house. The term 'trade house' shall for the purposes of this agreement be deemed to mean any house taking or accepting orders for the products of the members of the Society other than such as may be necessary for the due carrying out by the house in question of or in connection with *bonâ fide* orders for printing entrusted to such house." Any fresh advance or alteration of prices determined upon by the Association is to be notified to the Society, and mutually agreed upon before its putting into operation. Withdrawal of members of the Society is not to take place until the case has been considered, and such action agreed upon by representatives of both the Association and the Society. Provision is made for the immediate employment by members of the Association of members of the Society so withdrawn.

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Mr. A. G. Hawkins on the Cold Matrix Process.

MR. ALFRED G. HAWKINS, of the Associated Newspapers, Ltd., has been on a visit to the United States to study the methods of newspaper production in use there, and in an interview with the editor of our American contemporary, the *Editor and Publisher*, of New York, he gave some interesting information as to the use of dry flong in the stereotyping departments of his London firm. In the course of the interview Mr. Hawkins said:—"The Associated Newspapers Ltd., with which I am connected, are the publishers of the London *Daily Mail*, having a circulation of 1,000,000 copies; the *Evening News*, 800,000 copies; the *Weekly Dispatch*, 750,000 copies; and the *Overseas Mail*, which circulates among the Colonies of Great Britain, 350,000 copies. An edition of the *Daily Mail* is also printed in braille for the blind. Beginning the first week in September and continuing until the last Saturday in April, we also publish the *Football Evening News*, which has a circulation of 300,000 copies. In Paris we issue a Continental edition of the *Mail*, and in Manchester we reproduce the London edition, which is sent to Scotland, Ireland, and Wales.

"The large number of editions which we publish necessitates the making of 12,000 plates a week for the presses. We have three standard autoplate machines with which to do the work.

"We have adopted the new method of dry stereotyping, and my experience with it is as follows:—About this time last year a representative of a firm in Germany called at Carmelite House, London, the home of the Associated Newspapers Ltd., with a specimen of dry flong. Mr. C. F. Hart, formerly mechanical superintendent of the *Brooklyn Eagle*, and now mechanical manager of Lord Northcliffe's papers, interviewed him and brought the flong to me to try.

"As a result of our joint experiments we concluded that it had great possibilities, and Mr. Hart went to Germany and spent two or three weeks in investigating. As a result of his inquiries he arranged with the makers to send us further supplies. They also agreed to act on any suggestions we might offer after each trial, so as to produce a flong that would give the desired result. The result of this co-operation was such that we were able to work the flong so successfully that in February of this year we shut down steam power altogether in the foundry, took away the platens and offered the composing department the drying tables for imposing stones if they cared to have them.

"The initial cost of the dry flong is, of course, greater than that of the old wet flong, but by the time the paper is sold to the public it more than pays for itself. In the first place, the type is never heated, and, therefore, stands the wear and tear infinitely better and longer than formerly, as the temper of the metal is not destroyed. Secondly, the time taken to dry the mould in the old style is absolutely done away with, and this means that the press-room gets a start at least four minutes sooner than under the old method.

"Further, there is a shrinkage of about a quarter of an inch in the length of the

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mould. This means that the page must be made up that much longer before moulding, so as to give the publisher the desired length.

"This is a good feature for the advertising department, for it means that in lengthening a page of, say, seven columns, seven extra small advertisements of three lines each can be inserted. The extra revenue derived from these advertisements will more than meet the extra cost of the flong.

"I find also that I can get infinitely better results with half-tone pictures, owing to the fact that when a forme is moulded with wet flong, the flong is so soft that it has to spread itself between the interstices of the points of the screen and very seldom leaves the whole of the work to the shoulder. An inspection with a glass of a stereo plate produced in this way will show that the points are pyramidal in shape, which is the reason why the high-lights print dirty as the run goes on and the plate wears. The dry flong, however, owing to its toughness and the pressure employed in moulding, does not spread, but cuts down straight into the work, thereby faithfully producing a stereo plate which, for depth and shape of dot, is exactly the same as the original.

"Dry flong has undoubtedly come to stay, and I predict that it will not be very long before every newspaper will be using it. I am glad to think that, in conjunction with Mr. Hart, I was the first to give serious thought to its usage and work it with such great success.

"I have been much interested in visiting your newspaper offices. During my stay in New York I inspected the plants of the *Herald*, *World*, *Journal*, *Sun*, *Times*, *Eagle*, and *Globe*; in St. Louis, the *Dispatch*, the *Republic*, and the German newspaper; in Chicago, the *Tribune*, *Record*, *Herald*, *Daily News*, and *Evening Post*. I have also visited the leading newspaper plants in Cincinnati, Washington, Philadelphia, and Boston. In New York, the *Journal* appears to me to have the best facilities for turning out more work than any other newspaper in the city. The best laid-out press-room is that of the *Philadelphia Bulletin*.

"We do not have very much trouble in England with labour unions. We work harmoniously together with them, and the men seem well contented.

"The press equipment of the London *Mail* includes five double sextuples, one octuple, and five sextuples—all Hoe and Goss presses. As rapidly as possible, we are replacing the sextuples with double sextuples."

THE FLAT-BED OFFSET MACHINE is an ordinary lithographic machine with an extra cylinder geared to the ordinary cylinder so that a rubber blanket may be carried. Many existing litho machines have been converted into offset machines by the addition of this extra cylinder. The arrangement is really that of the tint-plate printing machine. Of course, it may be urged that a reciprocating machine can never be so fast as a rotary, but there are many jobs of which the run is small, that can be quite well run off at a speed of 500 to 1000 per hour, whilst it would be troublesome to make them ready on a rotary. Moreover, the work must be put on metal for the rotary, whereas on the flat bed either stone or metal may be used. Another point in favour of the flat-bed machine is that better register can be obtained on it for colour work than on the rotary. One reason for this is that the latter carries a flying gripper, which may slightly move the sheet as it grips it, whilst on the flat bed the gripper is stationary at the time the layer-on is feeding in the sheet. The offset cylinder may be quickly thrown out of gear and the machine used for direct printing as ordinarily.

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The Process Engravers' Association: The Annual General Meeting.

THE annual general meeting of the Process Engravers' Association was held on Tuesday afternoon, October 17th, 1911, in the Board-room of the St. Bride Foundation Institute, when Mr. Arthur Cox of Birmingham presided, supported by Mr. T. C. Eamer, vice-president, Mr. Ed. W. Hunter, treasurer, and other members of the Council and of the Association.

On the motion of the chairman the Report and Statement of Accounts were adopted. The report referred in detail to various matters of interest to the Association, and particularly to the attempt which had been made by the Amalgamated Society of Lithographic Artists, Designers, Engravers, and Process Workers to induce individual members of the Association to recognise the Society, and pointing out the desirability of refusing recognition until the Association had been approached.

So far no difficulties have arisen, and there does not seem to be any tendency either on the part of employers to adopt an *intransigeant* attitude, or, again, for the men to do other than deal with their own employers in cases of disagreement.

Mr. Arthur Cox was reappointed president, Mr. T. C. Eamer vice-president, and Mr. Ed. W. Hunter treasurer, while Messrs. Eamer, Harris, Lascelles, and Dent were elected members of the Council.

A resolution which had been framed as the result of a lengthy consideration of the proposal made some time previously for preferential terms of trading to be given to printers was then submitted to the meeting for approval. It was explained that communications had passed with the Master Printers' Association, who had approved the policy expressed in the resolution, and were prepared to work with Process Engravers if such a scheme were adopted by them.

No vote was taken on the resolution, its postponement being advocated on the ground that it was not universally approved by present members; and as further accessions to the ranks of membership were expected, it was not perhaps expedient to commit such new members to this policy without giving them an opportunity of independently examining the question.

When the formal business of the meeting was concluded, the chairman, who had referred to the subject when speaking in favour of the adoption of the report, again mentioned the work which had been undertaken as the result of a meeting called in the early part of the summer by Mr. E. A. Walmisley, who had invited the trade to consider some method of combination for the purpose of preventing a further fall of prices, and, if possible, of raising them to a higher level than the present. That meeting had appointed a committee to consider the whole question, and the committee had given some attention to the preparation of a plan which would be suitable for ascertaining costs of production, believing that a knowledge of such things would go a long way towards preventing the quotation by process engravers of unfair because unremunerative rates.

Mr. Arthur Cox is, as everyone knows, an enthusiast on the subject of costing systems, and is anxious that the Association should adopt the results of the

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labours of this committee, and although the discussion was admittedly irregular in connection with the Report, it was agreed to recommend the Council to take the matter up and consider any proposal which might be submitted to it from that Committee.

A vote of thanks to the chairman brought to a close what had proved to be an extremely interesting meeting.

Does a "Guaranteed Circulation" really benefit the Advertiser?

"THERE are not many potential buyers of high-class articles, and the larger circulation may include fewer of them."

This was the point that was under discussion at the October meeting of the Fleet Street Club. The introducer of the subject was Mr. Edmund S. Messervy, of Funk & Wagnalls, who took the view that if the publisher solicits advertising he ought to disclose the exact nature of the service he proffers.

Circulation was a term that in some cases meant numbers printed; in others, copies placed on sale; and still in others, net sales.

He realised that the quantity of prospective buyers was far more important than the total circulation, for he wanted the publisher not only to state circulation, but class of reader, and to give information as to distribution in an official statement. He thought such information would enable the advertiser to appreciate what prospective buyers he could hope to reach and enable him to specialise on his "copy."

Mr Coram, of the *Westminster Gazette*, replied to Mr. Messervy. He argued that the real point is the potential purchasing ability of the public reached. An advertiser of a high-class commodity should not, in Mr. Coram's opinion, hesitate to advertise in a medium of small circulation, if it reaches the class to which he is endeavouring to sell, even if another paper can claim four times its circulation. The advertiser should know, if he be a man of intelligence, that there are not very many potential buyers of high-class and expensive articles in the country, and the larger circulation may quite possibly include fewer of them.

In the debate that followed, opinion was fairly evenly divided.

Mr. E. S. Hole, writing in *Printers' Ink* (from which we quote the above) on the same subject, thinks that "there is scarcely anything more stodgy than the average British advertisement. It is this undeniable stodginess which is the cause of poor returns. It is usual, however, when our schemes are not successful, to cast around for someone else to bear the blame, and for the British advertiser the media he uses are a fitting butt for this purpose. When results are not so extraordinary as the advertiser thinks they should be, then, thinks he, it is the media which caused the fluke," instead of his own inability to draw up an advertisement that will bring results.

"It is an obvious proposition that a good advertisement in a bad medium will yield better results than a bad advertisement in a good medium. It is the advertisements which make or mar the medium, not the medium which makes or mars the advertisements. . . . Choice of media is infinitely more important than extent of circulation."

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The Value of Illustration.

HERE are more excerpts from the little publication under this heading produced by Mr. Carl Hentschel.

Mr. Selfridge writes:—

"Illustrations which honestly picture the merchandise described in the advertisement are undoubtedly a very great aid, and add much to the value of the advertisement itself.

"We have proved our opinion of them very prolificly during the past year and a half, both in newspapers and in catalogues."

Mr. William H. Lever writes:—

"Dear Mr. Hentschel,—In reply to your inquiry as to whether I consider illustrations add to the value of advertisements, it seems to me there cannot be any two opinions upon the enormous value of clever, striking illustrations attracting attention to advertisements."

Mr. A. W. Beville, the advertising manager of Messrs. Hampton & Son Ltd., practically enforces Mr. Hagen's point that the advertiser must get good service from the artist and the engraver, which, of course, cannot permanently be had for the price of poor work; and therefore he must pay a fair price, which is always true economy.

In the long run we pay most for anything we try to get for nothing.

But let Mr. Beville speak:—

"The answer to your question, 'Do illustrations add to the value of advertisements?' depends wholly on the quality of the illustrations. Surely no one can have the hardihood to contest such a self-evident truth!"

Here is a letter from Mr. Balch, speaking for Scott & Bowne (Scott's Emulsion):—

"My dear Hentschel,—In my opinion the day has gone by when there can be any argument on the question of whether or not pictures are useful in advertising. I think where possible they are absolutely essential. Pictures are quicker than type. A picture does not necessarily mean a landscape, but I use the word in the sense of any sort of decorative device which succeeds in driving home an advertisement. Our own fisherman trademark is a picture that is known throughout the world, and is never seen by anybody who does not connect it with Scott's Emulsion.

"It is not necessary to go into details concerning what pictures are, or should be, but the fact, in my opinion, remains absolutely incontestable that an advertisement containing a picture has five times the chance of being immediately understood, for most lines of goods, of an advertisement without the picture. In this I may say I also include type displays of novel or unique kinds which in and of themselves are pictures to the eye, which is best satisfied with beauty of outline."

Mr. Gamage gives us thirty thousand arguments:—

"Dear Mr. Hentschel,—In reply to your letter of the 9th inst., I am a great believer in illustrative advertising, so much so that I would say the value of an advertisement is increased 75 per cent. from an order-pulling point of view. Our general catalogue of 1142 pages contains, roughly, 30,000 illustrations. I think a picture conveys an idea of an article to a would-be purchaser which no letterpress would do.—With kind regards, I am, yours faithfully, A. W. GAMAGE."

Comment seems superfluous.

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Facings and Pacings.

By "Ion."

OUNCES of instance are worth tons of generality; so here goes this month for a few instances definitely known to the writer as to the printer's experience of the latest form of electro—that of deposited iron and nickel, harder than steel, and called "Nickeloid." I am confining these records to the King's Printing-house foundry (Messrs. Eyre & Spottiswoode's). I may give other instances of other foundries' fine work a little later.

In January of this year a Midland firm wrote: "We think you may be interested to hear that we have been testing your nickeloids against the ordinary electro, and our experience is that the *nickeloid will last three times as long* as the ordinary electro. We have had four sets for a particular job on a sheet, three electros and one nickeloid, and we have renewed the electros three times, whereas the nickeloid has lasted right through the run."

A week later the same firm wrote: "A short time ago you made us some lead-moulded electros, steel-faced, and I think it is only due to you to say how pleased we are with the quality. I enclose you two or three sheets from the last ream of 175,000 run.

"This was run through without any trouble whatever—not once stopping to change plates, or to patch-up make-ready, and from the appearance of the plates I believe they are good for another edition of the same length."

Others testify as to electro prints being "equal to the originals," a familiar phrase, perhaps, but meaning very much when on the lips of really and admittedly competent judges.

The following relate to special hard copper electros from the same foundry: "We send you under separate cover a sample of the printing from the last set of plates supplied.

"We have now had 427,000 impressions off each 2-lb. plate, and 259,000 impressions off each 1-lb. plate." The "2-lb." and "1-lb." are mere identification marks; they relate to articles of merchandise and not in any way to the electros. Again:

"We enclose you herewith our official order for a new set of electros.

"In making up our accounts we find that we have printed from the last set of plates taken off the printing machine, which was the last set but one you supplied, 6,323,440 2-lb. cartons, or 790,430 per plate; 2,006,400 1-lb. cartons, or 501,500 off each 1-lb. plate.

"We have pleasure in sending you herewith a report received from the foreman of our printing department, giving the dates when the last four sets of electros were put upon the printing machine, and the number of cartons printed therefrom.

"The electros with which you are supplying us now are a very great advance upon anything which we have tried before.

"REPORT.

Date when electros were put on machine.	No. of 2-lb. cartons printed.
June 7th, 1910	5,127,240
August 27th, 1910	6,333,450
Dec. 3rd, 1910	6,572,680
Mar. 6th, 1911	4,396,800."

ERRATUM.—On page 256 in October issue, in 2nd column, *for* *f*/11 in footnote appended to "St. Mungo's" article, *read* 11 millimetres.

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My Causerie.

THE late Mr. Pulitzer, the owner of the *New York World*, is spoken of as the maker of the American Sunday journal as we know it. He was a man to leave a strong mark upon anything he touched. The man who when he arrived at New York, almost penniless, in the early sixties, found that he was not allowed to land, and thereupon dived overboard at night and swam ashore, was likely to be a pioneer, at any rate a man who would count in any sphere in which he moved. He had a very large part in influencing the direction in which newspaper illustration developed.

One may point out the obvious but possibly forgettable fact that all the enthusiasm and all the force of his character would not have enabled him to get to shore that wonderful night if he had not first submitted and disciplined himself to the drudgery of learning to swim. And again, he would not have suddenly made a powerful impression upon a man who noticed his skill in chess play if he had not set himself to the drudgery of mastering the knight's erratic springing moves and the rest of the chess rules complications. The moral is simply that neither an ardent, impetuous character like this Hungarian Jew, nor any other of us, is exempt from the necessity of trying to understand the elements of the business he handles. I wish I could induce all who have to order or to arrange for newspaper illustration to acquaint themselves a little better with the elements of blockmaking.

One would not then see many such letters as I have known sent to an electrotyper by a printer. "I send a photograph," or "I send a drawing, and I want an electro from it. I don't want a zinco or a wood block but an electro; for which I understand your price will be 8d. or 9d."

Of course, where due pains are taken to understand the elements of one's business as well as possible, it is then an enormous advantage to have a fierce, eager-spirited temperament as, well—to be Pulitzer-like, in fine.

Don't, for instance, be like the late Duke of Devonshire, of whom the story runs that he once said: "I went to sleep yesterday and dreamt I was addressing the House of Lords, and I awoke and found I actually was doing so."

I don't think Pulitzer, for all his money and for all his readiness to spend it, would have been able to make the British public cotton to the wide acreage of the American Sunday paper; not even with all the help of its multi-colour illustration.

The report of the fourteenth Traill-Taylor memorial lecture will be something to note and inwardly digest; I mean Dr. Rosenhain's November 14th talk at the Royal Photographic Society on "Optical Glass." He speaks with authority on the technique of this subject.

A book of specimens of students' work issues from the *Inland Printer's* Technical School, conducted under the International Typographical Union Commission at 632 Shernan Street, Chicago. The course of instruction is divided amongst such branches of the printer's craft as principles of design, study of colour, composition, and display, in addition to other of the technical processes. Students of the School, situated in all parts of the world, testify to the benefit derived from this instruction.

Index of Current Literature.

IN the October *Zeitschrift für Reproduktionstechnik* the editor remarks upon the fine catalogue illustrations he saw at Turin Exhibition, and says that England, and particularly America, offers an example to Germany in this respect. There is also an account of a new newspaper illustration machine, namely, one to make the illustrations by offset lithographic process first and then pass along the paper to receive the text in the same way as the rotary photogravure illustrations. The author says there is advantage in the speed with which the plates can be prepared and in the edition they will print over the photogravure method, but naturally the results are not so rich in the shadows.

Other articles deal with further "Comparisons of Intensifiers and Reducers," "Three and Four-colour Printing on Matt Art Paper," and "Deep Etching for Half-tones."

Le Procédé for September deals with the effect of certain colouring matters on gelatine, and quotes a patent for making blocks by electrotyping from gelatine plates developed to give a sufficient relief. This is a similar process to that of Henry Sutton shown here in the year 1891, and found to be then quite inferior in results produced.

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L.C.C. School Notes.

THE entries for the new session at the L.C.C. School of Photo-Engraving are just about the same as at the corresponding period last year, there being an increase of ten individual entries. Preparation of Originals and Design classes are exceptionally well attended; on the other hand, the ordinary drawing classes still have room for students. Most of the process classes are comfortably full; the series of descriptive lectures on photomechanical work seems to fill a need, and the papermaking lectures are also going better than last year.

Very gratifying letters of thanks from old students taking up better positions were read at the last meeting of the advisory sub-committee.

Mr. D. P. Wallace, a representative of the Trade Union on the advisory sub-committee of the L.C.C. School, resigned his seat, which has been filled by Mr. A. Ellis Jones, the chairman of the London Committee of the Trade Union.

Mr. Snowden Ward has also resigned his seat on the committee, owing to his absence in America preventing his attendance. There is no doubt, however, that he will continue to afford the school his help, which has been so much valued in the past.

The collotype room is now equipped with a specially designed collotype oven, which is electrically heated and regulated by a Thermo regulator. The School was the first to employ electric heating for this purpose, and the experiment proving successful a new oven was designed, which answers admirably. The top is novel, since it consists not of cloth as usual, but of two sheets of iron perforated for ventilation, the perforation being arranged so that no light penetrates the interior. The oven is also fitted with means for a regulated admission of cold air should it be required.

The following gifts have recently been made to the School:—One of the sumptuous catalogues of the Crystal Palace from Messrs. Knight, Frank & Rutley. This is illustrated by photogravure plates throughout. Two examples of colour collotype from the Oxford University Press, and several examples of Rembrandt Intaglio Company's rotary photogravure, some of it in colour.

Messrs. Hunters Ltd.'s all-metal camera is now installed in the photographic studio; and a complete Albert outfit is placed in the etching room, though it is not yet connected up for working.

The specimen books of the various printing schools bear witness to the service the school of photo-engraving is doing for them in the shape of providing blocks. Thus every illustration, with the exception of one, in the St. Bride's specimen book is produced by the School of Photo-Engraving, and the Boro', the Central School of Arts and Crafts, Camberwell, and Oldeham Institute all acknowledge handsomely the help they have received.

MESSRS. PENROSE are selling for the Arthur Cox Illustrating Company a 2s. 6d. chart that enables the proportionate reduction of any piece of copy to be seen at a glance, and underneath it a ready reckoner is provided, which gives the number of square inches in any block.

MESSRS. STEINHEIL, the well-known Munich firm of opticians, issued a handsomely bound volume made up exclusively of handsome half-tone and collotype reproductions of portraits taken with their larger aperture lenses, the "Unofocal" and "Triplar," as well as a few made with the Steinheil "Orthostigmat." Most of the illustrations are the work of portrait photographers, notably Herr Grainer of Munich.

MESSRS. JOHN SWAIN & SON, LTD., of Columbia House, E.C., issue, besides their beautiful and always most valuable *Swain's Quarterly*, a specimen book of their stock tints, of which there are no less than 116 varieties, these comprising, in addition to the usual stipple, line, grain, and machine tints, many special designs drawn by Japanese artists. Some of these designs are used to border the sample tints, both designs and tints showing the better for this juxtaposition.

THE REAL REVOLUTION IN PORTUGAL is to be in its photography, if we may infer favourably from the receipt of the first handbook of colour photography issued in the Portugese language. The author, B. dos Santos Leitao, deals chiefly with the trichromatic processes of three-colour negative-making and printing, and assigns a leading place to pinatype as the means of preparing colour prints. The manual is issued under the title *Manual Practice de Photographia a Cores Sobre Papel*, at the price of 500 reis.

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THE LONDON COUNTY COUNCIL AND THE TILLEY CAMERA. — Our advertisement columns give further details regarding the progress made by that interesting newcomer into the process-engraving world, the Tilley Camera. It will be remembered that Mr. Tilley has long been associated with one of the best-known supplying houses in the process-engraving trade. He has now established himself in business with partners in 62 Eagle Street, Southampton Row, Holborn, within a hundred yards of the Holborn Restaurant. The earliest weeks of his business career have been signalised by what he naturally regards as an important recognition of the value of the Tilley camera.

One of these cameras has been ordered by a very important purchaser; the paper bearing the order has been headed with the words, always welcome in such association, "London County Council." That body has decided, of course upon the recommendation of the Principal, to instal a 12×15 improved camera made after Tilley's patents, with four dark slides, together with special fine focussing adjustments, with screen holding bar and spring steel tape, with indicator showing exact camera extension at any time, the camera to be fitted with Ross Homocentric and metal mirror, but holding mirror at minimum distance from lens. There are further specifications regarding the lens and the mirror. By the way, Messrs. Tilley & Co. have also naturally been gratified by what appeared in the October 13th issue of the *British Journal of Photography*. It happened that that journal had just arranged to publish a few notes on the Tilley camera, and it was with an amused interest, therefore, that it received from one of its readers a letter at one and the same time praising that journal for its refraining in a general way from overmuch praise of articles on the market, and reproaching it gently for not having told its readers how a Tilley camera had been devised with a steel cable instead of the old rack-and-pinion motion. The editor could not admit any mild impeachment, for he had naturally been well aware of this camera, and a footnote to the letter conveyed that nothing but editorial exigencies had prevented the earlier appearance of a note dealing with this and any other advantages of the Tilley camera. Our representative called the other day upon Messrs. Tilley and there saw on different floors evidence of the serious and enterprising manner in which this construction of cameras is being tackled. A very fine planer was one thing which particularly took our attention. One of the gentlemen associated with Mr. Tilley is an expert in timber matters, which has been very helpful in assuring that the very best which the world can provide in the way of timbers for camera construction shall be requisitioned for this service.

MR. R. C. ANNAND DETAILS INTERESTING EXPERIMENTS.—"In 1904, more than seven years ago," says Mr. R. C. Annand, writing to the *Newspaper Owner*, "I carried out a series of experiments in the evolution of a dry flong for news stereotyping, and used the process with a fair measure of success in the printing of the football edition of the *Shields Gazette*. I patented my process on December 9, 1904, Patent No. 26,899. I had a plate of steel prepared with corrugations or indentations and projections on its surface, the size of the largest newspaper page. I put this on the mangle, beat into the corrugations a sheet of very stiff backing. I then pasted on to the corrugated backing one or more of thick and fairly strong well-sized sheets of paper. I next put the plate with the flong on it under the drying press and dried it in the usual way. The flong came out with a plane level face and a corrugated back, much resembling the back of an ordinary stereo mould or matrix when dried.

"After allowing the mould to absorb what moisture there was in the atmosphere, I used it as a mould and rolled it into the type with the mangle. The corrugations on the back were compressed flat where the type was, but where the blanks were they stood up.

"My difficulty was to secure a suitable facing paper that would stretch and conform to the convolutions of the type and not burst. I was aware at the time that experiments were being strenuously made in Germany by papermakers to evolve a suitable mould, and I got to know the material out of which the German dry flong is made. I corresponded with a number of our chief British papermakers that have machines for making cardboard, and I offered to carry out any experiments with flong that they would make, free of any cost to them. I told them the flong was made chiefly of cotton cellulose and that their ordinary machinery would produce it.

"They all, with one accord, politely excused themselves from taking up the manufacture of flong. It is quite probable that had a British maker been found to interest himself in the matter, we would have been able to obtain suitable dry flong in our own country. At present all our supplies come from Germany."

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DEATH OF MR. H. SNOWDEN WARD.

We deeply regret to announce the almost sudden death of Mr. Henry Snowden Ward, the founder and the long-time editor of the "Process Engravers' Monthly." A cable to his friend and one-time associate, Mr. Geo. E. Brown, editor of the "British Journal of Photography," says that death has occurred in New York, the cause being an abscess in the ear. Mr. Ward, we understand, was under fifty years of age and looked even younger than his actual years.

The news will come as a shock and carry a sense of real personal loss to very many. From his youth in his Bradford birthplace, and onward through years of strenuous toil in London and America, Mr. Ward had maintained a singularly cheery and companionable spirit, and his professional achievements were of no mean order. He had just gone to America, not simply for another of his quite remarkable tours of popular lecturing on photographic subjects, but also as British Commissioner representing the Dickens' Fellowship, and he was to lecture at Boston on the centenary of Dickens's birth, Feb. 7th, 1912.

He leaves a widow, who was with him in America in his illness. She is the daughter of Mr. Weed Barnes, a well-known American. She collaborated with him in several books and other publications. There are no children. Mr. Ward had three brothers, two in business in America and Canada and one in Australia. The world-travelling propensity of the Briton was thus well typified in his family. The thousands who knew his "Photogram," "Process Engravers' Monthly," and "Photograms of the Years," and his various books and miscellaneous writings will be conscious of a friend departed, while to more intimate acquaintances the loss will be abiding and deep. He was the soul of honour, and emphatically was one of the world's encouragers and one of its most serviceable men. He was keen in leisure as in work, and incidentally was one of the Legion of Frontiersmen. We bid him farewell with sadness, with which mingles no little pride in him as a fine specimen of mankind.

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Estab. Jan. 1894.
"The Process Photogram."

THE PROCESS ENGRAVER'S MONTHLY
THE PROCESS PHOTOGRAM ESTABLISHED JAN 1894

VOL. XVIII. No. 216.
DECEMBER 1911.

AND ELECTROTYPER'S AND STEREOTYPER'S REVIEW

A Process Review of 1911.

A REVIEW of the progress of process work for the past year is best obtained by turning over the twelve past numbers of this monthly, but it may perhaps be as well to glance at the salient events in one short article.

The early history of half-tone has received a notable contribution in the address given by Mr. F. E. Ives at the summer Congress of Photo-Engravers in America, and especially in the remarks that it called forth from Mr. S. H. Horgan as to very early manufacture and use of line screens.

There is no difficulty in observing the exact state of achievement in process, for in the way of general grouped displays of the current half-tone product we have *Penrose's Annual* here in England and *Klimsch's Jahrbuch* in Germany. The *American Graphic Arts Year Book* apparently did not appear last year. To make up for it, the American printing papers, especially the *Graphic Arts* and *Printing Art*, give every month the most wonderful show of supplements, and not far behind them came the *Inland Printer* and the *American Printer*. Process also was much in evidence at the International Exhibition at Turin, though not so much was shown by England as by Germany. On the other hand, in England there was a fair exhibit of process work at the Royal Photographic Society's Exhibition, and a capital educational show at the press section of the Coronation Exhibition at the White City, where also the whole process was demonstrated in practice.

Not much that is revolutionary in apparatus has been put forward during the past year. Tilley's camera, which uses a steel wire as a means of focussing; the Holström etching machine, a machine similar in principle to Mark Smith's but constructed entirely of porcelain, including the paddle wheel; and a Rotary Cut Surfacer, appear to be all that are new in England this year. Dallmeyers have put an improved lens for process work on the market; Penrose has improved the gold-blocking type of hand-press so as to make it semi-automatic; the All-metal Camera has been placed out in the trade; and some attention has been paid to camera stands and lamp supports. The Holt etching machine has been taken up by Messrs. Penrose and is getting into use.

The most notable event in the method of producing work is the adoption by several German newspapers of rotary photogravure. The success of this has

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led to several other suggestions for improving newspaper illustrations; *e.g.*, having a separate cylinder for the illustrations only, as in the Magdeburg *Anzieger;* another, the coupling up of an offset press to the ordinary rotary. Newspaper enterprise in process matters is astonishing: thus last year we had the *Daily Mirror* putting a whole plant and staff on board the Irish Channel steamers to make blocks of the photographs taken of the King and Queen when in Carnarvon and Dublin.

Ordinary newspaper illustration has much improved. Some of the photographs taken at the Coronation were themselves remarkably good, and well reproduced in the newspapers. A panoramic camera was used in some cases, with great success.

The enormous number of interesting photographs that editors want to reproduce, and the limited space they have to show them in, is causing attention to be turned to stripping, and during the past few months there have been some excellent examples of clever work of this kind.

Half-tone is being increasingly used in photo-lithography; a suggestion that has been adopted is to use the bromoil process, especially for large work.

The Huber-Bleistein patents, which cover machines for producing photo-lithographic work in quantities, are now being exploited in this country, apparently having successfully commenced work in America.

Offset printing for half-tone work is also gradually being mastered. During the year there have been several very pleasant examples of three-colour produced in this way.

Collotype, at any rate in colours, is certainly reviving, thanks largely to the efforts of the Medici Society, who have had reproduced by this process a very large number of famous works of art. Much of this work they are now able to get done in England.

Rotary photogravure continues to make progress, and several firms are now turning out commercially satisfactory work. The Rembrandt Company are commencing to combine rotary photogravure with lithography to supply colour, with eminently satisfactory results; otherwise rotary photogravure in colour does not seem to be making headway.

As regards the counting-house side, chiefly owing to the Coronation, it is probable that photo-engravers have never had such a busy year, and happily the business side of the work is attracting more attention now than ever before. "Costing" is very much to the fore.

The Anglo-Engraving Company have removed to larger premises; so have the Marshall Engraving Company; and Messrs. Hunters, the supply house, have also been obliged to move to accommodate their increasing business. The prognostication that the smaller businesses would be absorbed by the larger ones has not, so far, come true. On the contrary, several new small businesses have been recently started.

On the whole, the process trade has had an exceptional opportunity during the past year, and should be able to commence the next with the courage born of satisfaction at some notable achievements. There certainly remains a great deal to be done, both in the original and in the duplicating trades; and it is true that the year closes amid signs of quite notable changes and developments of policy—or impolicy—in both spheres. The more need to encourage each other and press strenuously forward.

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The Electrotypers and Stereotypers: The Present Position.

"It is my own. Surely I can do as I choose with what belongs to me without consulting anyone else," is a statement we sometimes hear in the heat of controversy. There is something in the assertion, but not everything. We well know in how many ways our individual right is limited or conditioned by the rights of our neighbours. We are only free to do as we choose with our own so long as we do not infringe upon the rights of others. We have only so much freedom as is consistent with the general freedom. We are all of us interdependent, whatever airs of independence we may put on.

Do not considerations of this kind need to be borne in mind just now during the friendly controversy being conducted between the houses in the electrotyping and stereotyping trade? It is well known that from time to time efforts have been made to bring the various trade houses into line with the object of securing a minimum price below which electros and stereos should not be sold. From some cause or other these efforts have generally ended in failure.

It is not our purpose to discuss the causes of such failure — they are well known to those more particularly interested in the subject. We would rather turn our attention to the movement now in progress and endeavour, in any way in our power, to make the present position clear so that all parties may be helped to reach a sound conclusion.

We understand that in the effort now in progress about seventy-five per cent. of the trade houses have undertaken, with the aid of the men's unions, to maintain minimum selling rates for a period of five years, but that under certain conditions the agreement may be cancelled upon three months' notice. This agreement having been made between two trade unions, obviously cannot be enforced in a court of law. However, as all the signatories are men of position in the trade there is little doubt but that it will be strictly adhered to — except . . . .

We understand that this seventy-five per cent. of trade houses turn out about ninety per cent. of the electros and stereos used in London. Consequently the remaining houses are not only small in numbers, but still smaller in the volume of work they produce. In that regard they may be called a ten per cent. body. Yet it is this minority of ten per cent. that claims what, to adopt ecclesiastical language, may be called the power of the keys.

It will itself remain outside a proximate paradise, and it will by so doing keep the door locked against the ninety who would fain make the happy entry. Talk of the tyranny of the majority; could it ever at worst be so bad? But what tyranny is there at all in striving to improve conditions for both masters and men?

It is just here that our opening sentence as to doing what one likes with one's own comes into play. All the houses in question have invested their money and that of their shareholders in their respective businesses, and after a long and anxious period have come to the conclusion that present prices do not give a fair return for the labour and the money put into those concerns. Consequently the houses

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putting out the 90 per cent. of the work have agreed between themselves that they will not compete upon price, but that speed and quality of products shall be the ground of competition—prices being maintained at least up to a fixed minimum.

Now, their businesses and their capital being their personal property or under their control, no one can dispute their right to do as they choose with their own. They have a strict right as a trade union to enter into an agreement to maintain prices if they so choose. In conceding this we also concede to the minority the right to do as they choose with their own, viz. the right to refuse to enter into any agreement. What is right for the one is right for the other. In a case of this kind it is not necessarily a fact that the majority must rule, unless they can do so by moral suasion or by ulterior force —which we prefer not to discuss at present.

One sometimes wonders what there is in the make-up of some business men which prevents them looking at questions such as that now under discussion with breadth of view and impartiality of judgment. It would seem to most of us that we are in business for the purpose of making money in the easiest and most direct manner possible. Consequently, when a proposition is put before us by which we are reasonably assured that we can make an extra 10 per cent. or 12 per cent. on our returns, we naturally give the proposition careful consideration.

If we are rightly informed, this is the proposition made by the majority of electrotypers and stereotypers to the minority, and it would seem as though there must be some quite phenomenal considerations impelling the minority to reject such a tempting offer—an offer which most business men would hail with satisfaction. It certainly would be interesting to know more about the position taken up by the minority, and their reasons for declining to fall into line.

Perhaps in our next issue we may be favoured with a view of their side of the case; for it must be very evident that with the power of the men's unions behind them, there are vast potentialities with the majority, should they determine to push matters—powers we should be very sorry to see put into motion. While we would deprecate extreme action upon their part, we would urge upon the minority to give the proposition their most careful consideration, and not to reject it except upon the most unexceptionable and most substantial grounds.

In all such controversies as this there is always present in some men's minds a feeling that agreements for price maintenance are not ideal. We know there are often great and almost insuperable seeming difficulties in the way of such arrangements; yet we think that by patience and determination they can be surmounted. The certificate of a public accountant or a reputable and disinterested business man, of admitted special competence for the purpose, should be satisfactory evidence that a given profit has been maintained—thus leaving every house to take advantage of any method of reducing cost or special knowledge it may possess, to sell at what price it thinks best, and to arrange what terms may be most suitable for its particular business, providing the minimum profit is maintained.

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The "Wratten" Works Description.

We think it will be found that the description elsewhere in this journal of the work carried on in the Wratten & Wainwright laboratories and testing departments will stand a high test when measured by the readers' Interestometer (we really must use nomenclature in keeping with the subject). It must be a matter of some surprise even to those best acquainted with the products of plate- and filter-makers to note what a prodigal son of the craft Dr. Mees has long been; to note, we mean, with what prodigal disregard of the moment's convenience or the moment's cost accounting he sends to the scrap heap the products of days or even weeks of expert toil because they are not quite as perfect as they can be made.

This journal will be forgiven for not needlessly labouring technical jargon in the narrative. We might, for instance, enlarge on the wonderful Nepholometer. This is not an instrument used by nephews to test the "workable" capacity of uncles; but it functions in the investigation of cloudiness in plates. There are in these Croydon works many almost fearsome-sounding contrivances, and some which would actually be very dreadful in their effects if they were not properly handled; and we most certainly emerged from this tour of inspection with an enhanced respect for products which already we held in very high esteem. One simple note we would attach, that "scientific" to a scientist seems to be almost an interchangeable term with "accurate." If that is so, why not all call ourselves scientists in so far as we are conscious that accuracy is our aim? Surely many who have never supposed themselves to deserve the name have long been scientists unknowingly. Perhaps, *per contra*, some who receive the ascription do not deserve it.

There was one little side revelation which hardly fitted in with the article appearing elsewhere, but which might as well have its reference. An informant at these Croydon works told us:

"We get all kinds of questions any and every day. We try to answer them, and we do this without charge. Look, for instance, at the correspondence of the last few days. One man wants to know how long we fix a certain plate. 'Will it be any harm to leave it for three-quarters of an hour?' 'I have got a very thin negative,' another man writes, with the details. We say, 'Send us the negative and we will intensify it.' Another man wants to borrow lantern slides for a lecture on colour. We lend them freely. Another man writes of special difficulties in the photographing of furniture. Here is someone trying experiments with warm-toned lantern slides. He wants to get a good purple tone. This man, again, wants a quite special filter not usually kept in stock. We will lend him one. This next man wants guidance in photographing in infra red, using the quartz spectroscope. The next man is quite refreshing in his way; will we give information as to the relative speed of plates of different makers? We reply that we have no information as to the speed of other makers' plates. 'What plates should I use for photogravure?' another man asks; and so we go on all the time."

With that we might take leave of this subject on this page, merely referring the reader to the article elsewhere. But it occurs to us that this journal and the whole trade would be doing much less than justice to exceptionally zealous

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servants of the craft if there were no acknowledgment of the wonderful cheapness of the final product, reached through so many costly stages of production and rejection. Everything is relative. We no doubt have to consider the cost of flats or filters or plates in relation to our own purse. But as business men we have to consider them also in relation to such ruthless rejection of products not quite equal to the exacting tests imposed in the Croydon works. To hear of certain products of one whole month rejected is amazing, when we reflect with what nice and unceasing care that product must towards the month-end have been approximated to the standard. Supposing some of those slightly imperfect products had issued. They could obviously have been slightly cheaper than the prices actually listed; but how very much dearer would they not have been in terms of work unsatisfactorily produced or even turned back upon one's hands. Does not manifold experience attest that the best is the cheapest, and that nothing pays us better than that all who make our plates and filters and flats shall spare absolutely no means known to or discoverable by science to ensure the extremest accuracy and reliability? If some of us cannot lightly regard the precise invoice attaching to these goods may it possibly be that we are in the line of descent from Issachar? The biblical record in the last words of Jacob are that he was "a strong ass"; for he knew the resting-place and the pleasant paths, yet he bowed his shoulders to the task-master. He made needless trouble for himself. Issachar & Co., Ltd., however, show signs of bethinking themselves, and preferring to their progenitor's practice the Yorkshire counsel, "If thee dost owt fer nowt, do't fer thysen." With that simple wisdom there should be no difficulty in the plentiful purchase of the scientific products prepared with such jealous pride in their perfection; and which really, because of the amazing rejections upon most subtle tests, must be deemed to be extraordinarily cheap.

MASTER LITHOGRAPHERS AND "THE HOURS THEY ARE WORKING."—At a recent meeting of the Colour Lithographers' Committee of the Master Printers' Association, a resolution was passed in reply to Sir George Askwith's letter, that "The masters are quite satisfied that the hours they are at present and have for years past been working are reasonable, and regret that they are unable to accede to the suggestion of a further meeting with the Lithographers' Union."

A second resolution was also passed to the effect: "That the attention of the Government be called to the necessity for repealing the section of the Trades Disputes Act which authorises peaceful picketing. By means of this so-called 'peaceful' picketing, which is merely a form of gross intimidation, non-union men who were willing and anxious to take up the work laid down by the trade unionists at the behest of their unions have been grossly intimidated and prevented from doing so. And to the necessity for repealing the section of the Trades Disputes Act, which relieves the trade unions from the responsibility incurred by breaking a contract, a responsibility which is incurred by every other person or body in the kingdom, the result being that it is useless to make agreements with trade unions, as they disregard any agreement as soon as it suits them, and the employers have no redress in law."

And the secretary was instructed to send copies of the second resolution to the Prime Minister, the Chancellor of the Exchequer, the Home Secretary, the President of the Board of Trade, and the Leader of the Opposition, and to strongly urge that the Government should institute an independent inquiry into the state of the law with regard to trade unions, and to intimate that the lithographic employers of London would be prepared to give evidence at such inquiry from their own personal experience of the evils resulting from the present state of the law.

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The Return of the Periodical Son: Some Interesting Rotary Intaglio Notes.

THAT adventurous son of Fox Talbot, Mr. Frederick T. Corkett, gathered some, but not all, of what he had a while ago and took his journey into a far country. The people of that land called it America. He joined himself to some citizens of that country. They sent him into new fields to feed engravers. The parable must not be pressed too far. He has had a great time in New York, greatly advancing the art of rotary photogravure; and in January we are to witness the periodical's return, and those of us who know him well will certainly order veal on the day on which the good ship *Olympic* brings him over the water. There is a great deal for him to do in Europe, and he is not the man to let occasion slip. A portfolio of exquisite photogravure which he has sent to us may well express some results of his steady, persistent contribution for the craft upon this particularly interesting side. This work is now being carried on in the States under the name of the Corkett Intaglio Company. Mr. Corkett has been approached by the British Government with the object of taking up the process for record purposes. What, if anything, can be done in that direction may naturally enough depend on previous negotiations. It is possible that textile printing may be among the spheres in which rotary intaglio may count as a new and important force. An extract or two from a letter received from Mr. Corkett may, we think, be given with perfect propriety, and with interest to our readers. He writes from New York:—

"We have just completed what is perhaps the longest run of machine photogravure work ever undertaken, namely, just under a half million prints for a magazine here, and the work has received the highest praise and has been much appreciated by the public. Our process is characterised by very strong depths and deep shadows, and if you will compare it with other work you will find that it excels in this point. In delicate detail also it gives all that the original gives. I think that is saying that the process is all that can be expected. In America we are expected to do all sorts of extraordinary things: printing a number of subjects on a sheet that should not go on a sheet together; printing in almost impossible colours that should not be printed; in other words, doing all the things that the more sober printers (if I may say that) in England have turned down. This is as I expected it would be. As all this requires a great amount of skill, you may be sure our assistants are getting the best possible training. The process has great artistic beauty, and I think the specimens I send you will show you that we do not lack in such connection. Printing vignettes, reproductions of delicate jewellery, statuary, machinery, watches, and book plates are all in our day's work.

"My family and I are looking with pleasure to going back, but we are leaving behind us much that we shall regret; last, but not least, the American business man. I have found the American business men fine: fair in their business dealings, and, so far as my associates in our Company are concerned, no better, more fair-minded associates one could wish for."

We have said that the specimens for-

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warded to us by Mr. Corkett show his process in great beauty. This appears to us to be particularly true of one which reproduces very variegated marble. The distinctive quality of this process as compared with the mere inverted half-tone which in some cases seems to be accepted as satisfactory rotary photogravure, manifests itself to very great advantage in this particular subject. It does so by reason of the great opportunity of tone and tint contrast afforded by such a subject as marble. Other subjects which lend themselves particularly well to Corkett intaglio, and which in these specimens exemplify it to perfection, are the flowing locks of feminine beauty and the many-hued leaves of the forest.

The Advantages of Dry Flong.

THE stereotyping department of a printing office, large or small, is a place (writes an expert in the *Newspaper Owner*) where there is always a good deal of "rush" work, and in drying the wet flong a good deal of valuable time is lost. Here, therefore, is the first and most important advantage of dry flong. In rolling, packing, warming, and casting there is a saving of four to five minutes, and, in addition, no time is wasted in "pasting up."

In moulding dry flong the forme is rolled once—never more, or doubling would ensue—at the average rate of thirty seconds per double crown page. The slow, even cylinder pressure cannot damage the type.

Floor space and elbow-room, too, are worth consideration. Eliminate the necessity of drying tables and the moulding room is twice the size it was before, whilst the piles of blotting, tissue, and packing, and the jars of pastes, and packets or tins of miscellaneous powders, etc., are all done away with.

The initial cost of autoplate dry flong is, and, if I may be permitted to prophesy, always will be, considerably more expensive than the old pasted flong, but has the actual average cost, with due allowance for time, labour, pastes, various papers and waste, been properly calculated?

In one important and progressive newspaper office the actual difference in the size of 22 inch by 30 inch proved to be ¼d. to the disadvantage of the dry flong, and as dry flong can adequately be used rather smaller than pasted flong, in consideration of clean as against rough uneven edges, this was soon remedied. In this instance no rebate was made for the economies already mentioned or the saving of drying power—steam, gas, or what not—a very considerable item when calculated weekly, monthly, or annually.

Now comes shrinkage. A quarter of an inch is quoted in a 22-inch column. I suggest that this is excessive and could be reduced, if desired, by at least one half. As many "news" pages are moulded in the opposite direction to those in question, two-page-wide formes in particular, this is an important point to many foundry managers.

When dry flong is used entirely on a publication, no heat being used in the moulding room, surely one cool corner can be found in close proximity to the mangle, in which the flongs can be kept, either in a zinc-lined box or cupboard, or in a pile with a good solid zinc plate top and bottom, according to the quantity of stock carried.

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Improvement in Lead Moulding.

OUR contemporary the *Printing Art*, in discussing this question, says :—

"Probably no question has been more widely discussed in engraving and electrotyping circles in recent years than that of lead moulding. It was introduced a few years ago under the name of 'The Dr. Albert Process,' and has been the cause of more discussions and differences of opinion than any similar subject for the past several years. Many have claimed that the only way to produce good electrotypes of fine screen half-tones was by the lead-moulding process; others were just as strong in their claims that the wax method of moulding was equally as good and in many respects better. Others admitted that the principle of lead moulding was good but that its present application was faulty in many respects, and improvement would be necessary before it would be practical commercially. The discussions and controversies caused by the various opinions of the advocates of these different views brought to light many new facts and ideas, and seems to have resulted in some real improvements.

"The greatest weakness of lead moulding, as operated in the past, has been the fact that but a few square inches, or a very small portion of the plate, could be moulded at a time. The method has been to mould the first few inches of the plate, release the pressure, move up the plate, and mould the next few inches; release the pressure again, move up the plate, and so on, until the entire plate had been moulded. This method consumes a great deal of time, thereby increasing the cost, and has brought up the natural question of how could a uniform mould under such conditions be secured? The theory has been that the tremendous pressure required was so accurately adjusted that each portion of the plate received precisely the same amount of pressure and thereby a uniform mould resulted. This has not, however, always proven true, and a great many practical men in the electrotype business have contested this point, claiming that, to be successful, the plate or pattern would have to be moulded in one impression, but this has been mechanically impossible, up to date, with the equipment at hand.

"Mr. Welsh of the Welsh-Royal Electrotype Co. of Philadelphia is one of the practical electrotypers who has contended that the old method was wrong and that the one-impression theory was the only practical manner in which lead moulding could be done, and that machinery could be built to work successfully along those lines. He devoted a great deal of time and thought to the problem, and decided to demonstrate the practicability of his ideas. He has recently had a moulding press built that would accomplish the results desired. It is now in successful operation in Mr. Welsh's plant in Philadelphia.

"This new press is a massive machine, built of solid steel, is hydraulic in its action, and is capable of producing a pressure of three thousand tons. It is driven by a five-horse-power motor and is absolutely under the control of the moulder at all times; it will mould any size cut from one inch square up to the full capacity of the press, which is 20 by 25 inches, at one impression. While the press is capable of producing three thousand tons pressure, it has been found that two thousand tons will mould

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in lead at one impression a fine screen half-tone the full size of the press, so it has a surplus power of one thousand tons. It is equipped with an automatic attachment that will release the pressure the instant two thousand tons is reached, whether the moulder was present or not. He could start the press, walk away, forget it, or do many of the other things that he might do but should not, and there would be no evil results, as the pressure would be automatically released one thousand tons before the danger-mark was reached. There are gauges for depth and pressure which show at a glance the progress of the mould, and permit the releasing of the pressure within five pounds of any desired point. A very ingenious attachment automatically carries the pattern into the press and deposits it in the exact centre and returns it to the moulder after the mould is made. There is also a slow-speed attachment that acts automatically the instant pressure is applied to the mould; in fact, it seems to be so well provided with safety devices that it fulfils the builder's claim of being 'fool-proof.'

"The work produced so far has fulfilled all expectations. The writer saw a lead mould made on this press by Mr. Welsh, in one impression, of a very difficult subject, a copper half-tone, 18 by 22 inches, 150-line screen, that was perfect in every detail. So it would seem that the problem of lead moulding had been solved and another great step toward perfect electrotypes accomplished."

A New Era for Colour Process: Four-Colour Sheet-Fed Rotaries.

ONE-IMPRESSION CYLINDER.

DURING the past few years there have been a great many improvements in the making of process colour plates. With the perfection of the collodion emulsion and the several direct dry-plate processes, a thorough understanding of the principle of colour separation by the operators, and a vast improvement on the part of the etchers, both in a knowledge of colours and the manner of etching, it would seem that perfection had been reached, at least in the methods of the present day. Advancement in "making-ready" skill or obtaining accurate colour values from plates has not, however, kept apace with engraving, and engravers generally will, no doubt, be gratified to learn that this condition is about to be changed and colour printing that prints plates exactly as they are made is soon to be a fact.

The C. B. Cottrell & Sons Co. have perfected and placed on the market their new sheet-fed rotary four-colour press, and the Schweinler Press in New York have installed this new press, and demonstrated the practicability of printing a monthly magazine produced in four colours of the highest class of colour printing.

Sceptics as to the press and process have maintained that while it might prove successful in magazine work it would never be able to compete successfully with flat-bed presses in commercial colour printing. This contention is about to be thoroughly dissipated by practical demonstrations. The Sears Roebuck Co. of Chicago have recently installed two of these presses in their printing department. They are to be used in the printing of coloured inserts for the many catalogues

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this firm publishes. At present the press and process are receiving a very severe test, printing carpet and linoleum inserts in colours; and when compared to sheets printed on flat-bed presses, from the same original plates, the work of the new press is superior in every respect, thus proving it a great factor in colour printing of all kinds.

Four Colours at Once.

This new press is operated in conjunction with the M'Kee process of make-ready, and is the result of the inventive genius of Mr. M. A. M'Kee, a practical printer of wide experience, who a few years ago patented the several unique processes necessary in the operation of the press and make-ready apparatus.

The press and make-ready process are so radical in their difference from the methods commonly used in colour printing that they must be seen to be believed, let alone appreciated. Instead of printing one colour one day, another the next, and so on, with the many attendant evils, all four colours are printed at the same time with one operation, the sheet passing through the press but once, with one holding of the cylinder grippers, and when delivered it is the finished product, having been printed in the four colours of yellow, red, blue, and black, ready for trimming or binding, as the case might be.

The press is built compact and small, comparatively, occupying about the same amount of floor space as an ordinary flat-bed machine. It is simple in its construction, having no unnecessary attachments, and is fitted with a double automatic feeder, one for the white paper and one for the slip-sheet. There is but one impression cylinder for the four colours; this is situated at the top of the press and is surrounded by the four-plate cylinders, all of them being easily accessible, and so located that they receive the same degree of heat from the atmosphere.

The Four-Colour Vary in Stiffness.

The principle of laying one colour upon the top of another without drying has long been considered impossible, but Mr. M'Kee has accomplished this in a very simple manner. The secret is in the ink used, each colour being made a different consistency. The yellow, or first colour printed, is very stiff and thick, being about the consistency of putty. It would be impossible to use this ink on any other style of press. A minimum quantity of ink is used and heavy pressure applied, so much so that the plate is left as clean as if it had been wiped. The red or second colour is not quite so stiff or thick as the first colour and is applied in the same manner as the yellow, with the result that the stiffer yellow colour deposited on the sheet draws the softer red ink off the plate and on to the sheet. The blue ink is softer than the red or second colour, and the black ink or last colour is softest of all. The finished result is an exact duplication of the engraver's plates in every particular, the tone-values being retained in every instance.

One of the remarkable features of the press is the fact that the colour on any or all of the plates can be regulated and the result seen instantly. For instance, if the finished product during a run appears too red or yellow, as the case might be, the pressman can determine immediately which colour is in excess, and he needs but turn a couple of fountain screws and the change is seen, not in one colour, as at present, which calls for considerable speculation as to how the other colours will affect it or be affected, but upon the completed product with all colours printed, without spoiling a sheet. One noticeable feature of the

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printed sheets is the absence of that peculiar reddish cast so common in all process colour printing done on flat-bed presses. Instead, the greys, browns, purples, and all of the other difficult colours are reproduced in exactly the same colour values as the engraver etched them in the original plates.

The capacity of the press is marvellous: three thousand sheets an hour has been attained and maintained, which is equal to twelve thousand impressions an hour. The press will print in one, two, three, or four colours. But the greatest feature of the press is the fact that every sheet delivered is the finished product, printed in three or four colours as required, and ready for delivery as far as the press-room is concerned. And in this fact lies the interest of the photo-engraver. It is an admitted fact that the inability to print good colour-work in sufficient quantities has done more to retard the growth of this branch of the business than anything else. In the general adoption of this method of colour-printing seems to lie the removal of this obstacle, and that, coupled with the fact that plates will be printed as they are made, giving the exact colour values as they are etched, and the complete product delivered where at present only one colour is printed, makes the future of process colour-work seem bright indeed.

The Evil of Too Much Money.

GERMANS are very efficient; yet in normal circumstances the British worker is better, having more initiative and intelligence. German industry is too regimented. We should not expect too much, considering that while we've been a great industrial nation for over a hundred years, Germany has only taken high industrial rank for about forty years, and had a bad start owing to the French indemnity. The millions France had to pay came near to ruining German manufacturers. French factories had to work night and day to produce the goods wherewith Germany could be paid; and they got into the way of doing things on the bigger scale and more economically, and flooded Germany by their rushed-up export trade, selling desperately cheaply; and thus when the indemnity payment was over, what was left permanently was a new and very serious competition by these improved French workshops.—From *Leaves of My Notebook*.

An Alleged Danger in Quartz Lamps.

ONE hears with a shudder that if one looked hard and directly at a quartz lamp even for only a minute or two, one would become blind. It would bleach out all the violet in the retina. It seems to be the bleacher *par excellence*. The lamp has been used for testing printing inks. It is exceedingly good for that work. As it burns, ozone is created, and you may bend and get a good sniff of that peculiar garlic-like pungency which we suppose we should encounter, though we do not encounter it, if the air at our various seaside Skegnesses were as ozony as we are in the habit of declaring it to be. As a fact we have more chance of encountering specific ozone in the tube railway than at the seashore. In the Central London Tube there are big pipes

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installed to the Tube's order by a private company, from which pipes so-called Ozon-air is breezily wafted into the stations. As to just how much good results from such infusion of ozone scientific men are not agreed.

The trade has not been well instructed as to how dangerous quartz lamps are to those who are ignorant of their power; how they are to be handled, how the sight is to be protected. There will be some tragedies some day if the due knowledge is not soon spread abroad.

To the Trade?

Such was the "catch line" on an invitation card issued by the "Institute of Printers and Kindred Trades of the British Empire" for the purpose of alluring the process engraver, the electrotyper, and the typefounder to a debate on "The Disloyalty of the Wholesaler to the Printer"; and if we are rightly informed, a very lively debate ensued, and there was some very plain speaking, seemingly not without reason.

From the statements made it would seem there is much discontent in "the trade" at the practice of going behind the printer direct to his customers, and in this we heartily agree.

It seems a pity that such an interesting debate should not have been adequately reported. Perhaps another time those responsible may see their way to invite the editor of the *Process Monthly* to any discussion in which process engravers are so deeply interested.

The following brief report has been kindly handed in by one who was present at the meeting:—

Mr. W. H. Burchell, Vice-President of the Institute of Printers and Kindred Trades, opened with a paper on the "Violation of Trade Principles," in which (as a printer) he complained of the wholesale stationers, process engravers, electrotypers, typefounders, and similar supply houses canvassing the printer's customers direct, and making no difference in price even when approached independently; he deprecated this tendency, which was throwing the printer into the position of an accessory or mere tool, and denying him the power of controlling his productions or of knowing where he stood in trading economy.

All the trades were represented at the meeting, and very few diverse opinions were heard, most of those present being in accord with the speaker's views.

A prominent electrotyper explained how the recent agreement in that trade would enable proper recognition to be made of the printer and a middleman's discount allowed him in future.

A member of the Process Engravers' Association also produced a resolution which had been drafted in conjunction with the Master Printers' Association, showing how the better-class engraving houses favoured the establishing of a recognised discount to the printing trade; he explained also how his own firm graded the discount according to the trade status of the buyer, and would not allow their travellers to canvass outside the printing and allied trades.

After a most interesting discussion, the chairman, Mr. Job Morris, proposed a resolution with a view of furthering these principles, the same being unanimously carried.

The evening closed with the usual vote of thanks to speaker and chairman.

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Talks with our Friends.

No. 2. DR. KENNETH MEES (Director of Wratten & Wainwright, Ltd., Photographic Platemakers, of Croydon and Buda-Pest).

(*Continued from p.* 286.)

Testing department and research department —Two orders of testing—Consequent differing necessities in apparatus—Filter-making—Something like rejection — Flats — Four tests for three-colour filters—One five-thousandth of an inch — Producing daylight for plate-testing — Silver deposit plotted on a curve—A Doubting Thomas and the blue printing on the label—Vital need of original research—A new process intensifier.

We must keep the same heading as covered this feature last month—not for conventionality of publication but as a sort of guarantee of good faith shown in continuance. We are not, however, setting forth conversation hereunder; for the reason that the unique works of Messrs. Wratten & Wainwright are what we have now to deal with, and they and their operations are such as it would be difficult enough in any case for the reader of a disjointed chat about them thoroughly to understand. Of all places we ever visited this is the one conspicuously demanding to be treated in a very orderly—shall we say scientific?—manner. The product of our own talks with Dr. Mees at his factory and laboratories will therefore, we think, be best presented in a simple narrative form. We may then hope to begin at the beginning and proceed smoothly throughout, carrying the reader's easy comprehension with us.

The scientific side of the Wratten & Wainwright works may be divided into two sections:—

The Testing Department, which is engaged in controlling the product sent out from the factory, and the Research Department, which is engaged on investigations.

The essential point about testing instruments is that while giving sufficient accuracy for the purpose for which they are to be used, they shall at the same time work very rapidly; this usually involves that they shall work as far as possible automatically; and this again usually involves the testing instruments being both complicated and self-contained, so that they can be used if necessary without advanced scientific knowledge.

Research instruments, on the other hand, are made as accurate as possible; but as research is only done by a trained investigator, there is no need for the apparatus to be "fool-proof," and, moreover, time-saving is not such a consideration as it naturally is when you have to repeat operations many times.

THE TESTING SECTION.

Taking the testing section first — the testing instruments as used by Messrs. Wratten & Wainwright naturally fall into two classes — the instruments for testing filters and the instruments for testing plates.

The filter-testing instruments are not in the laboratory proper, but in the filter department, and are directly under the charge of the head of that department. When a new method of testing is suggested by the research department or found to be needed by the filter department, it is worked out in the research

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laboratory and then embodied in a complete and self-contained instrument which is installed in the filter department. A large part of the instruments installed for all sorts of purposes are made in the works, and some are quite wonderful examples of costly complication and inexpensive simplicity in material.

The instruments for testing filters are subdivided into those for checking the colour of filters and those for measuring the optical accuracy of the filters.

Wratten filters are made by coating coloured gelatine upon glass, and then, after drying, stripping the coloured film from the glass and cementing between two plates of specially selected optical glass. When the film is delivered from the coating-room, each sheet is compared with a standard film which is kept for that purpose, and which has been standardised by direct measurement of its absorption curve on a spectro-photometer. Those sheets of film which deviate only within certain small limits from the standard are passed, the remainder being rejected. The limits run from 2 per cent. to 10 per cent. according to the film.

Heavy Rejections.

The rejections are extremely heavy, the number rejected considerably exceeding those passed.

The instruments, therefore, for testing the colour film consist of a spectro-photometer and a comparator.

The optical glass in which the filters are cemented is of two kinds: " Flats," prepared by Messrs. Adam Hilger, Ltd., ground with the accuracy of high-class lenses, and white optical glass of the highest quality which can be purchased in sheets. This glass is bought in large quantities, and is then examined for parallelism and flatness, and the best portions picked out, over half the glass being rejected. This, then, is cut up into small pieces, and these are tested on the large test instrument used for testing the definition of the filters. The accepted glass is then cemented with a film between the two sheets, and the filter is dried for six weeks at a standard temperature. After cleaning, the filters are ready for testing.

One Five-thousandth of the Inch Demanded.

Three-colour filters are tested by four different tests:—

1. For definition.
2. For effect on focal length.
3. For register.
4. For any side shift of the image on change from one filter to another.

The definition and focal length tests are made by placing the filter over a lens of four feet focal length, the image being observed by a high power eye-piece. Filters cemented in optical flats are required clearly to define and separate lines even when in an image those lines are only one five-thousandth of an inch apart. Filters in ordinary glass are required to define and separate lines one five-hundredth of an inch apart. The tests for register and shift of image are made upon a different instrument containing an anastigmat lens of ten inches focal length, in which the distance between the two sides of the image in each picture can be measured with accuracy to one five-thousandth of an inch.

A set of tricolour filters cemented in flats are required to register within one seven-hundred-and-fiftieth of an inch, while filters in ordinary glass must register to one hundredth of an inch.

One can understand when such figures

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are borne in mind how inevitable it is that there should be a very large wastage. On the very day of our visit, practically the whole of some violet-coloured filters which represented the previous day's work, and which presented an imposing quantity, were thrown away. They were about 25 per cent. on the dark side.

There was one month in the history of the works when the whole of the filters made in the month were condemned, and none of them were allowed to issue.

The Definition Test.

The test for definition was also of extreme interest. One sat upon a stool so few inches from the ground as to consort admirably with editorial modesty, and looking through the eye-piece, and sliding it laterally, one secured focus. A cross-line screen so noted was black and well defined, but with a defective filter became fuzzy, the image being magnified fourteen times. We might note that in the case of the instrument used in this definition testing, wheels beautifully made, and each of about 2 inches diameter, were parts of the instrument, and one entire revolution of either of these appreciably large wheels registered a shift of half a millimetre. Consequently, when the graduations upon that milled wheel are taken into account, it is very understandable that a reading of one five-hundredth of a millimetre is quite manageable.

So much, then, for the filter-testing, carried on as we have seen in the factory proper.

Plate-testing, on the other hand, is done in the laboratory, though the emulsion rooms have a simplified form of testing apparatus, by which to make very rapid trials of their plate before and after coating.

Daylight Condition Produced.

The plate-testing in the laboratory is based on the system of Messrs. Hurter & Driffield, the instruments designed by Dr. Mees being used. The plates are exposed to an acetylene burner, the light from which passes first through a screen which alters its colour, so that it becomes identical in spectral composition with daylight, and then through a sector wheel which allows the light to act for different times on different portions of the plate; the exposures being given in steps, of which each one is double the preceding step. A narrow strip of plate is exposed, and consequently a strip of exposed plate is obtained bearing a series of nine known exposures, ranging in intensity from 1 to 256.

After exposure, the plate is developed in an instrument which maintains the developer at a constant temperature, so that the plate can be developed for a fixed time at a fixed temperature in the standard developer. Then the plate is fixed, washed, and dried, and the amount of silver deposited and due to each exposure is measured in a photometer and plotted on a curve against the exposure. In this way the sensitiveness to light of the plates and the rate of development is found, and information so obtained is embodied in the data on the card which is sent out with the plates, the numbers being printed in the laboratory by a small hand printing-press.

One over-confident customer, or at any rate critic, of the firm remarked upon the obviousness of the fact that each batch of plates could not be separately tested, seeing that, as a matter of fact, the figures expressing the results of the supposed testing were printed. He had omitted to note the trifling circumstance

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that the number of the batch was also printed; but since then these figures are printed in blue ink, the rest of the card being printed in black ink.

The plates are further tested in the same manner for their sensitiveness under each of the three colour-screens and under the "K" orthochromatic screens, and the increase of exposure necessitated by the use of the screen is there published to the plate-buying world upon the card.

X-Ray Plates.

When plates are required for special purposes they are always tested under as near to working conditions as possible.

X-ray plates, for instance, are tested by means of a special installation consisting of a powerful coil, or alternatively on a compressed air induction machine. The process plates are not only tested for sensitiveness and density, rate of development, and colour sensitiveness, but a screen negative is made of each batch by means of the camera with a half-tone screen, which photographs a small black wedge, thus comprising within an area of about a quarter of an inch square the whole range of dots from closed-up highlights to the smallest shadow. The negative so obtained is examined under the microscope.

For testing plates for spectroscopic work there is a very complete outfit, including most powerful instruments, especially an eight-foot focus grating spectrograph, which gives a dispersion of no less than twenty inches in the visible spectrum.

Original Research Vital.

The special feature of the laboratory is its research work. Dr. Mees holds very strongly that original research is the life of the laboratory, and that if a works is to develop new ideas or new products it should at all costs devote a large amount of money to scientific research.

The research work of the works laboratory falls into two distinct classes. First, investigation relating to methods of manufacture or to new manufactures. Secondly, investigation relating to the use of the manufactured goods, or to purely scientific results in connection with the subject.

In regard to the first branch of research, any firm is naturally unwilling to publish much information. It is represented in the Wratten laboratory by a very completely equipped dark room, in which we were informed that small quantities of plates could be made under rigidly controlled conditions, from which the results were capable of direct application on the largest scale.

Much work, however, is always going forward in relation to the firm's present manufactures, and to general photographic application. At least two original papers are published every year from the laboratory; and that is in addition to the large amount of new information published in booklets or books directly issued by the firm.

Research Instruments.

In connection with the more important researches which have recently been published, we were shown a reducing camera used for the work on resolving power, and a Wedge spectrograph on which the absorption spectra of dyes had been measured, also a radio-micrometer used for standardising light sources, together with an electrical installation for the trial of small standard electrical lamps.

One room has for a considerable period

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been devoted to a special investigation of fogging rate of development, one paper having been published at the Royal Photographic Society last year, and a second being due shortly. It is expected that this investigation will last for some years, and that it will probably result in a complete series of papers. A most complex method of investigation has been evolved, including electrical measurements and the methods utilising the interference of light beams. Distant as the methods may seem from photographic work we are assured that the results would have a very direct part in the everyday work of photography.

A piece of apparatus that was just being adjusted at the time of our visit, and which seemed to promise later on a paper upon a little-known branch of photography, was a large quartz spectrograph, in front of which was a big mercury arc lamp.

A New Process Intensifier.

A novelty of considerable interest, which is just ready for the process market, is a new process intensifier which intensifies dot or line negatives without increasing at all the density of the interspaces. It, so to say, cuts away fluff from the dot, or keeps transparent lines clear as on line negatives.

Sometimes complaint has been made that Messrs. Wratten's products are expensive, although as a matter of fact most of them are not dearer than other manufactures of the same kind, while, considering the care devoted to their production and the proportion of actual cost to selling price, the makers may well be forgiven for their confidence that their products are not only the best value to be had in photographic materials, but are probably the cheapest scientific productions in the world.

The whole idea actuating the firm has been to offer nothing but the best that can be produced at a price which should just cover expenses. The best is naturally expensive to produce. It means the use of only the very best materials and the employment of the most careful workmanship; and it means, finally, exhaustive testing with many rejections; but if production is carried on throughout as economically as possible, then such expense cannot be considered extravagant, and the consequent price cannot be considered as anything but reasonable, and will be willingly paid by everyone who sees that it enables them to entirely depend on their materials.

In the case of the colour worker, for instance, the cost of plates and filters is but a small proportion of the total cost of any completed piece of colour work; and we cannot but feel that some of the credit for the excellent colour work now being produced at low cost in England is due to Messrs. Wratten & Wainwright Ltd. for the absolutely reliable materials which they place in the hands of the engraver.

F. C.

A new Lamp from Bradford.—The United States Consul of Bradford has sent to his Government an account of a new lamp invented by Max Weertz, of Bradford, England, pointing out that it should be of particular interest to colour printers who operate night shifts or those who are compelled to use artificial light for the press-room illumination. The lamp may be used for electric current or in connection with a gas or incandescent oil lamp. The principal feature seems to be a special ray filter composed of green and blue glass. The claims make it appear that colours can be matched with the light of this lamp, and that it has the advantage of cheapness and uniformity in quantity and quality, as well as extraordinary illuminating power.

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My Causerie.

MR. H. J. HAUGHTON, the Secretary of the Buffalo Photo-Engravers' Union, No. 4, is a brisk talker. Hear him on the matter of employment of incompetents:—

"My particular branch is process photography, and I have in mind a worker who earned £7 per week, and refused to join a union, on the plea that a good man can always find and secure his own price. However, he quit his job and had to drop to £2, 10s. per week, and work much harder to hold his place. The schools and polytechnics (he is speaking, note, not of Great Britain but of America, which has nothing answering directly to our Municipal or County Council Schools of Engraving) have been mainly instrumental in ruining the process trade, as formerly they would take anyone in, give them a sort of infant school education, and launch them broadcast like a bunch of pirates on the craft. I was personally acquainted with some of these, who offered to work for nothing until such time as they should make good. The loss to the employer through these men was indirectly borne by the competent workman, evidenced by a cut into his wages.

"The employing photo-engravers in England are in worse condition now (paying low wages) than they were ten years ago (paying high wages). If all employers were forced to pay good wages there would be no such thing as unfair price-cutting through employing cheap labour. I have known a firm to discharge a highly-paid man and take on cheap labour, immediately cutting the prices. These greenhorns from schools, etc., were sometimes taken on at a three to five years' contract, at a miserable wage, to be discharged if they could not earn it, or to make a pile of money for the boss if they turned out trumps.

"The prime object of unions is to regulate the number of apprentices and to fix a minimum scale. The scale is only for those who are least competent, but not by any means for 'duds.' The better workman can always demand money in proportion to his ability."

The note is part of the correspondence in a contemporary relative to the association of professional photographers' assistants in a trade union.

I would attach the reflection that one of the causes of non-success is that one does not soon enough change inefficient into efficient service. That does not necessarily mean immediate discharge; nor discharge at all. But it does mean re-arrangement, and the requirement that for 20s. paid in wages there shall be taken up 20s. plus enough to represent a fair proportion of the employer's own maintenance and future provision account.

A business paying 20s. and taking up 19s. is doing the thing which even Micawber in a familiar passage could tell us meant misery. I am well aware that some workers are kept on who cannot yield very efficient labour. "If Brownson goes to sleep, we don't wake him," one manager said to me. Good old Brownson had put in many years; the firm stood by him. But, then, they hardly took him into serious account as a worker, useful as he might be at times. They regarded keeping him on as an act of goodwill, a benevolence. That was right enough. Where that wealthy firm would have gone wrong would have been in winking at inadequate service on the part of the men in their prime, on whom it was relying for its best output.

I know these are commonplaces. But the obvious things are the things we commonly forget.

Get as high skill as possible, paid for by as high a wage as possible. It's economy. It's the only really just course.

It is curious how practices differ in different lands, even when the results aimed at are identical. In American practice it would almost certainly not be the case that large half-tones would be made and transfers made from the half-tones on to a lithographic medium, stone or metal. The half-tone negative itself would be applied direct and all this intermediate work saved. The idea of making the half-tone plate and then transferring from this is presumably that the transfer shall be made from something which will not shrink, otherwise a photo-litho transfer paper would seem to fill the bill. But why the direct transfer from the half-tone negative should not be made is a puzzle. Yet in London practice at this day—in certain London practice, at any rate—the method still continues of realising these very large half-tones in metal before the transferring.

There are, too, at this day in English practice those who cannot understand the effective whirling of 30 × 40 (quad crown) stones so that they may receive a satisfactory sensitised surface for photographic transference. Yet this is easily enough managed any and every day in many places in the United States.

Perhaps a question arises as to the due impression upon such stones; what sort of pressure—by ordinary screw frame or pneumatic frame—is going to effect the purpose? and the

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answer is that this pressure problem has been effectively settled in America on quite different from the ordinary English lines.

So much in praise of America. But *per contra* it has to be remembered that American practice is very much behind ours in some other respects. The prevalence of the indirect method of making three-colour half-tones as against the direct method so commonly used in England is one instance.

In general, and speaking from the best authorities on which I can base myself, I might say that while the American engraver at his best is the equal of the British engraver, American engravers as a body are behind the British.

"Recognition" in a New Aspect.

MR. VINCENT PITMAN, one of the most able of our printing-works managers, has read a paper before the Printers' Managers' and Overseers' Association, entitled "Recognition: A Plea for Harmony in Printerdom." "Recognition" has come to mean specifically "recognition" by employers of their journeymen's union. But Mr. Pitman uses the term in a non-specific sense. Let journeymen "recognise" the large capital masters must find before they can provide occupation; at the same time let the employers recognise specially intelligent industry, and when a craft product has won a medal at some international exhibition, let the employers have the names of the workers who produced the specimen thus approved associated with their own in the award. At the Brussels Exhibition the promoters invited all employers to do this, and French and German master printers responded to the appeal, but British exhibitors did not.

The Managers' Association adjourned their discussion of the paper, and four of their ablest members submitted papers criticising or developing points made by Mr. Pitman. Some of the comments were more witty than wise. One wanted to know if Odol (the well-known tooth paste) and the due brushes were to be provided in the already compulsory lavatories; the Odol and brushes to be used by the most conscientious workers only, as their "recognition." A more serious word was that, on the whole, bad, not good work already rules in offices. Again, what workers were to be named in awards where many had helped, and how was jealousy to be avoided? One manager was very doleful, because, he said, the compositors of daily newspapers had all sorts of privileges, and yet this had not secured their contented and hearty and happy working. The reference was perhaps to the fact that the newspaper compositors lately levied themselves 10s. per week to assist other compositors to get the fifty-hours week, although they themselves already enjoyed forty-eight or shorter hours.

The Care of Half-tone Screens.

IN most cases the half-tone screen is formed of two glass plates cemented together with Canada balsam, forming between them a layer of considerable thickness which only hardens completely with time. Compared with the layer of balsam utilised to cement lenses, the film of balsam between the glasses of a screen must be very permanent. Whereas in the case of lenses the sides in contact are optically worked with great perfection, and fit one on the other so exactly that only an inappreciable film of balsam is left between, the glass plates of the screen are rarely perfectly level, so that in all points where contact is not perfect there will be a considerable amount of balsam which requires a long time to resinify and dry thoroughly. Thus the yellow colour of Canada balsam would produce very perceptible discrepancies in tints, especially with American screens, for the English screens of Johnson are cemented with a specially decoloured balsam of great purity, which leaves the transparent parts of the screen perfectly colourless, whence an appreciable decrease in the time of exposure. To avoid these irregularities it is requisite to cement the screens at a high temperature and

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under very great pressure, which, thanks to the elasticity of the glass, brings the two sides into perfect contact. Thus deformed from their natural position the two plates are rather unstable in equilibrium. The least perceptible rise of temperature (this is common in summer in glass-covered terraces) softening the balsam, the glass plates return to their primitive form, leaving bubbles between them, which are very brilliant when examined by reflection. Screens which have been in use some years are less subject to this inconvenience than new ones, and withstand the effects of a high temperature without being loosened. Consequently, new screens should be kept in as cool a place as possible and tightening them too much in the screen-holder avoided, as pressure tends to produce deformation which may loosen the balsam. Certain precautions must be taken in cleaning screens. A scratch on the surface through clumsiness may render a screen useless, or at least necessitate tedious retouches on each of the negatives obtained. If the scratch is very light it will suffice to have the surface polished by a specialist. Usually, at time of use, the two sides of the screen are polished with a silk rag or piece of tissue paper. Thus the glass is greatly electrified and the screen becomes covered with a regular cloud of atmospheric dust which is attracted. Hence the necessity of not polishing the dry glass but employing a wet rag. It is, however, to be noted that any solvent of balsam, especially alcohol, should never be allowed to remain on the screen, as it would enter through the joints. It is preferable to work as follows :—

Having removed the screen from the apparatus, place it in its box or on a cushion of paper or fine linen, and then dust it lightly with a very soft badger's hair brush. A piece of cambric is now employed, moistened with a few drops of alcohol, to gently wipe the surface over. Another rag is used for drying; and to prevent electrification, breathe upon it before touching the screen. Press very moderately and pass the rag slowly over the surface. Rags for this work should be kept in a box out of contact with dust.

If metallic stains make their appearance on the surface, owing to fall of some drops of nitrate of silver and subsequent reduction, wipe them off with a piece of fine cambric slightly moistened with nitric acid in double its volume of water, and then, before cleaning as above, wipe the surface with another rag moistened slightly with ammonia. By observing these precautions there will be no danger of the least accident.—*Moniteur de la Photographie.*

School Notes.

MR. EDWARD HUNTER of the Anglo Engraving Company has been appointed a member of the advisory sub-committee of the School.

THE TILLEY CAMERA will be installed at the L.C.C. School before the re-opening of the School for the second term on January 8th, 1912.

NIGHT STAFFS.—Permission has been accorded by the Education Committee for admission in the daytime of those persons unable to attend in the evening on account of working at night, the fee to be the same as if they attended in the evening.

THE "OPTICAL V."—It is hoped that an Amstütz aerograph machine will form part of the equipment of the new School. This will enable convincing demonstrations to be made of the translation of tone into line by means of the V tool, and will help to the understanding of Ives' "optical V" formed by the cross-line screen.

THE ANNUAL SUPPER of the School of Photo-Engraving and Lithography will be eaten this year at the Gray's Inn Larder at 7 o'clock on Saturday evening, December 16th. This is always a very jolly function. Old students of the School are heartily welcomed, and there are few persons in the trade who have not been students at one time or another. The tickets cost 2s. 6d. each.

Brevities.

A NEW etching machine for copper only has been invented by Geo. H. Benedict of Chicago. He moves the solution up and down. A travelling "weir," in section like an inverted "V," makes the solution rise to the face of the plate and run over the back of it. It moves four to five times a minute.

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RETICULATION DIFFERENCES.—At the Nov. 7th meeting of the Royal Photographic Society Mr. W. T. Wilkinson read a short paper on "The Differences in the Reticulation of Gelatine obtained by the Use of Various Chromates and Bichromates." Mr. Wilkinson gave details of mixtures of chromates suited for use as sensitisers, and showed photomicrographic lantern-slides of the various species of grain produced. He dealt with the advantage as regards speed of printing of a suitable grain.

OFFSETTED DUPLICATES.—To meet the cases of newspaper and magazine wanting duplicate line cuts a simple method by a Danish inventor has been devised. The block is first made, and is inked as for pulling a proof. Instead of that, a clean compo or rubber roller is lightly passed over the block only once. This takes off an impression on to the roller, which is then applied to a clean metal plate. The effect of this is to leave a clean, sharp print on the plate. Naturally these offsetted prints can be repeated indefinitely.

KODAK SETS KINGSWAY A MUCH-NEEDED SPEED EXAMPLE.—Last November papers were publishing a reproduction of the architect's perspective drawing of the building planned for the Kodak Company in Kingsway. At that date the site was in the hands of the excavators. The huge block has risen week by week, and about a month ago received the whole of the office fittings, stock, etc., from the Clerkenwell Road premises of the Kodak Company, which have now been vacated. It is refreshing to note that the third floor is reserved for expansion in the Company's business. It contains, however, at present, a full-size cinematograph theatre, in addition to developing and printing-room for cinematograph films.

PICTURES AND WAR.—If the papers have lacked anything in the pen scenes (writes a contemporary relative to the Italian-Turkish War), it has been more than made up in the photo scenes. Such live pictures of actual war conditions and incidents have surely never before been taken. The illustrated papers have scored wonderfully, and the photographers at the front are to be heartily congratulated both on their excellent pictures and on their skill in getting them home—for good pictures are useless unless they can be got to their destination. I think when these men get back they will be telling us some capital stories of the means they had to devise whereby their parcels of plates were dispatched from the country.

THE "AMERICAN PRINTER" lately recorded how the Bush-Krebs Engraving Company, Louisville, Ky., installed the Denham Cost System. Shortly after it was installed they found that of 200 orders 112 showed losses and 88 showed gains. Recently, out of the same number 86 showed losses and 114 gains. The records also bring out the surprisingly high cost of line in small sizes. The *American Printer* devotes very much more space to British affairs than any other American journal, and it has quite a lot to say about how British illustrated papers coped with the Coronation occasion.

THE "GLASGOW DAILY RECORD AND MAIL" has just marked its sixteenth anniversary by presenting a gold casket and a silver cigar box to Sir Harold Harmsworth. He had interesting things to say about the paper in reply. "I would like," writes "C," contributor of "Newspaper Illustration Notes" to the *Newspaper Owner*, who chronicles this Harmsworth presentation, "to pay a tribute to Mr. Plews' remarkable work in the half-tone portraits in this journal. Of fairly open screen, they are extraordinarily clean, and each face is character revealing. They are most masterly."

LONG EXPOSURES.—There may be a point for some readers in this reply by Mr. Girdlestone, of the Westminster Engineering Co., Ltd., to an inquirer who wrote to a contemporary about his long exposures:—"It appears that your correspondent is burning them two in series 220-volt continuous current. This is, of course, a great mistake for photographic work, and if proper photographic lamps are employed they should be burnt singly on the 220-volt circuit; the exposures would then be about one-fifth of what they are with his present arrangement. No alteration in the carbons of his present lamps will make much difference."

AN AMSTERDAM FINE ARTS EXHIBITION.—H.M. Consul at Amsterdam reports that an International Exhibition of the works of living artists is to be held at Amsterdam, under the auspices of the Corporation of that city, from April 13th to June 8th, 1912. The exhibition is to include sections for designs in black-and-white, engravings and lithographs. Exhibits must reach the "Comité Exécutif, Exposition Internationale Municipale des Ouvrages des Artistes Vivants, Musée Municipal, 13 Paulus Potterstraat," Amsterdam, between February 26th and March 2nd next. A copy of the programme, etc., of the exhibition (in French) may

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be seen at the Commercial Intelligence Branch of the Board of Trade, 73 Basinghall Street, London, E.C.

INCREASING ARCS AND RUNNING IN SERIES.—There are many using the older forms of open-arc studio lamps, particularly those with only one pair of carbons, who are desirous of improving their light, but who shrink from the expense of an entirely new apparatus. In such cases we (*British Journal of Photography*) suggest consulting a practical electrician, with a view to increasing the number of arcs, running them in series in the way now so useful in the best modern patterns. This system is economical of current, as less resistance is required, the current being consumed at the arc instead of being dissipated in heat. Such alteration should not be attempted by anyone not thoroughly acquainted with electrical wiring, as certain modifications may be necessary in details, such as leads, fuses, and the like.

ILLUSTRATIONS IN HOUSE ORGANS.—"It is better," says a writer in *Printing Art*, "to omit an illustration than to use a poor one. If they are half-tones, 133-line will answer for most purposes, although with good paper a skilful pressman will get better results with 150-line. Abstain from vignetted half-tones and avoid trouble. Few pressmen can make ready vignetted half-tones properly, and those that can require plenty of time. A square or silhouette half-tone presents just as good appearance for most purposes. If a square, use a single line, about one point in weight. Elaborate border treatments have no place on illustrations for house organs, because they detract from the interest of the pictures. If you can secure the services of a good pen-and-ink artist, be thankful for it. He can take a muddy, out-of-focus photograph, from which it is impossible to make a half-tone without a great amount of retouching, and produce a line cut that will be a thing of beauty and not an eyesore."

EVERY TRIFLING SNAPSHOT TO HAVE A FIFTY YEARS' RUN.—Mr. Whorlow, the secretary of the Newspaper Society, writing to the *Times* from 346 Strand, W.C., sounds the alarm. Every trifling snapshot is to have copyright for fifty years, and all because there is to be no registration. The law as it has existed has been that no one could recover damage for any injury by way of ownership of works of art invaded, unless that injury was of a date subsequent to his registering copyright. Mr. Whorlow calls attention to the fact that what we are now going to witness, unless some amendment averts it, is the abolition of registration altogether. To talk of voluntary registration as having any real value he considers absurd. An incidental consequence of abolishing registration will, he says, be that false claimants will be greatly assisted. "At present as a preliminary to the enforcement of a bogus claim, an entry must be made in the register and a false claimant would consequently have to commit an indictable misdemeanour in order to be in a position to succeed." Meanwhile, we note, from another letter in the *Times*, that the editor of the *Newspaper Owner* asks, in effect "What is the use of registration, anyway?"

FOR TEACHING THE OPERATORS OF TOMORROW.—A project has been set on foot by the Autotype Company to provide a course of training in carbon printing under conditions which have been carefully considered with a view to providing printers in this process capable of dealing with present-day requirements. As a result of correspondence and conversations with Mr. Charles Sawyer, the director of the Autotype Company, it is possible to publish a brief outline of this new project:—

The Autotype Company, in their works at Ealing, which are the oldest and best appointed establishment, not only for the manufacture of carbon tissues, but for their use, proposes to admit a small number of photographers (of the male sex) not younger than, say, 17 years of age, and selected from the sons of master photographers and from photographic assistants. Here they would be taught the practice of carbon printing in its various forms and applications on the lines of a syllabus, of which the following is a copy:—

"Sensitising and drying of Autotype carbon tissue: safe edging of the negatives: dodging of unsuitable negatives in order to obtain satisfactory results: actinometers, printing for single transfer by daylight and electric light, on rough or smooth surface papers: for double transfer: waxing Sawyer's flexible temporary support: waxing opal matt plates: treating glass for transparencies and lantern slides: mounting the pictures on single transfer—on temporary support—on glass for transparencies or lantern slides: developing the pictures. Modification possible by having hotter or cooler water—rendering the prints insoluble in alum—rinsing and mounting on final support, *i.e.* opal, ivory paper, glass, wood, leather, aluminium, etc., etc."

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A CURIOUS EFFECT IN CINEMATOGRAPH PHOTOGRAPHY.—The various little pictures that make up the cinematograph film are taken in succession at intervals averaging about 1-16th of a second. Suppose a wheel with sixteen spokes to be rotating once every second, then it is obvious (says a contemporary, discussing matters cinematographical) that in each picture the spokes will all appear to be in precisely the same position. As a matter of fact, each spoke will have moved round one-sixteenth of the circumference of the wheel, but, all the spokes being alike, the fact that they have moved will not be apparent, and in the projected cinematograph picture the wheel will not appear to rotate at all, but simply to skid along the ground. This will always be the case with the sixteen-spoke wheel so long as the time of rotation is equal to a definite number of seconds; if, however, the period of rotation involves a fraction of a second, then the effect of movement is obtained, and whether this is a forward or a backward movement depends entirely upon whether that fraction is greater than or less than one-half. Suppose the wheel to rotate once in one and a quarter seconds. This is a lower speed than one revolution per second, therefore the spokes will not travel so far in one-sixteenth of a second. They will, in fact, only move four-fifths of the distance, so that in each successive picture each spoke will be seen in a position that is a little behind that which was occupied by the preceding spoke in the last picture, and, the spokes being confused one with another on account of their similarity, the effect is as if each spoke had moved backwards. If, on the other hand, the speed had been one revolution in three-quarters of a second, each spoke would have moved a greater distance, equal to one-third more than the distance between two spokes. In each picture it would therefore appear a little in advance of the position of the preceding spoke in the last picture, and so an effect of forward movement would be given. If the fraction involved is a half, then the effect is that of a very jerky forward movement, for the nearer the period is to a whole number the smoother is the motion.

THE "B.J." ON THE COSTING QUESTION.—Price-cutting will never (says the *British Journal of Photography*) be defeated by a frontal attack, consisting of mere abuse of the cutters, but a flank movement persuading them accurately to gauge their costs will be certain to prevent cutting being carried on to the extent of the product being sold below cost. This has been the attitude of the present president of the Process Engravers' Association (Mr. Arthur Cox), and his vigorous propaganda for many years past, lately reinforced by the independent support of Mr. Walmisley, is now beginning to tell; in fact, schemes of costing have been drawn up, and are being considered by the trade. But it must not be imagined that an accurate knowledge of costs will necessarily lead to a general rise in prices. Its first effect will probably be to open the eyes of the firms as to which sort of their work is the most profitable, and may actually lead to the lowering of prices on that sort. If different firms find that their most profitable work is that of different kinds, the result may have the unexpected effect of a lowering of prices all round, and greater specialisation by the various firms. If this should happen, then both the firms and the public would be satisfied, though it is difficult to suppose anything short of a general rise in prices will persuade some photo-engravers that they are not the victims of a wicked conspiracy on the part of the others who sell cheaper than they do, in spite of the fact that the latter appear to be doing pretty well, and are entirely regardless of anything else except getting as much more work as possible at the same prices. And Mr. Arthur Cox has always been sane enough to declare that, provided work is not sold below cost—which is, so to speak, "hitting below the belt"—lowering the price is a legitimate form of competition, as it means either that the firm is content with a smaller rate of profit, or, what is more likely, has worked out more efficient means of production, the benefit of which it is prepared to share with the customer in order to secure his patronage. In any case, one thing must not be forgotten, and that is, that even the most perfectly devised costing plan will be absolutely misleading unless it is thoroughly systematically carried out under the most efficient and continuous control, with constant checking. The expense and trouble of a costing system that is to be really accurate, and so not worse than useless, is something that is frequently overlooked, with the consequence that there is considerable disappointment and an unjust condemnation of an item in business management that is essential, if modern competitive methods are to be encountered successfully. This is especially true of the photo-engraving industry.

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THE PROCESS ENGRAVER'S MONTHLY

DEC 9 1911

THE PROCESS PHOTOGRAM

ESTABLISHED JAN. 1894.

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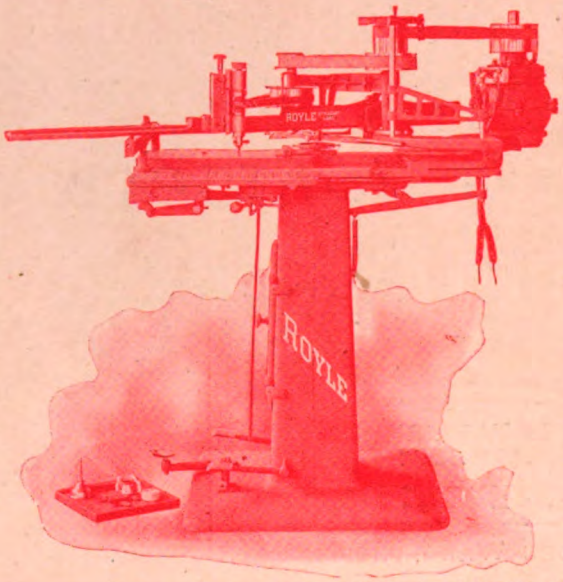

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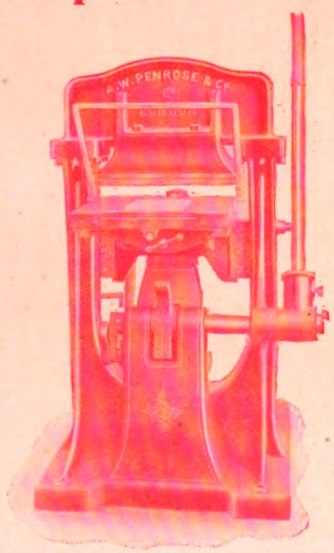

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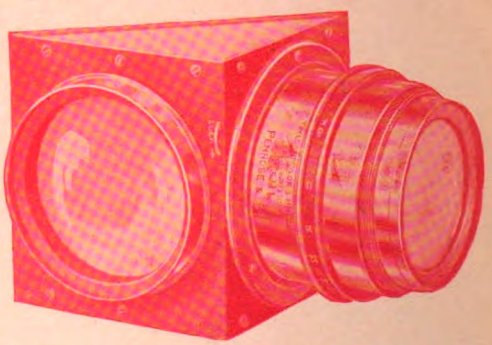

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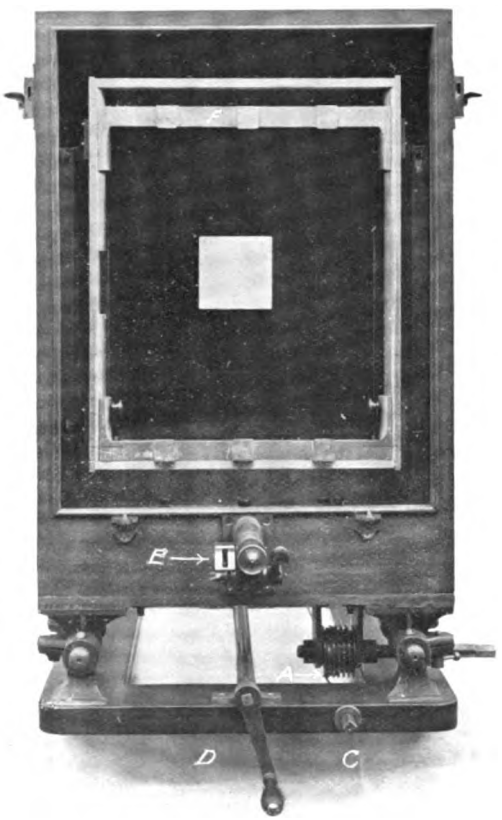

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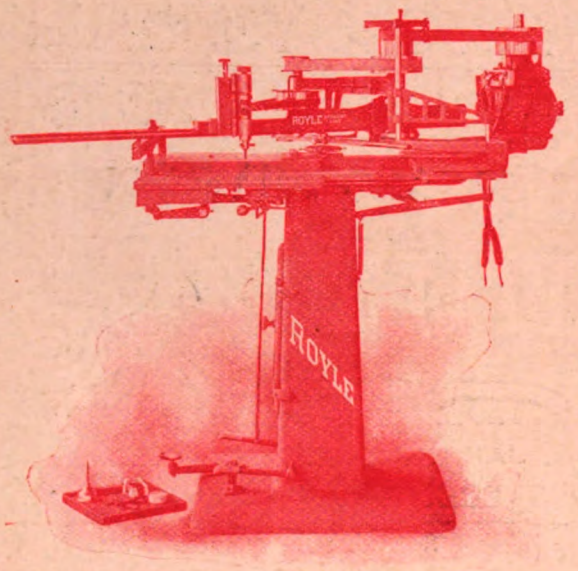

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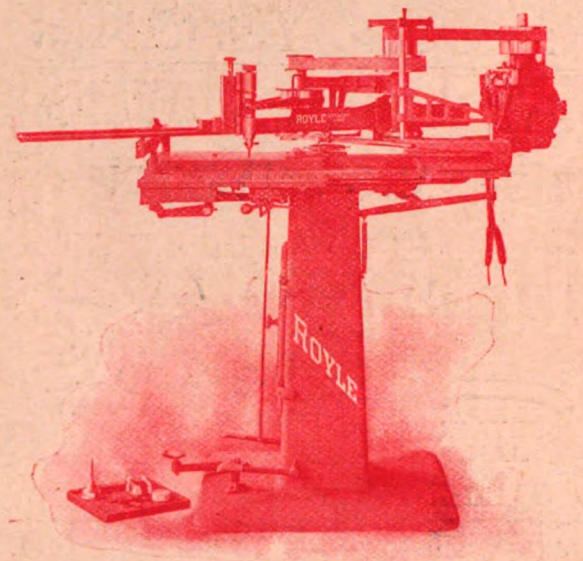

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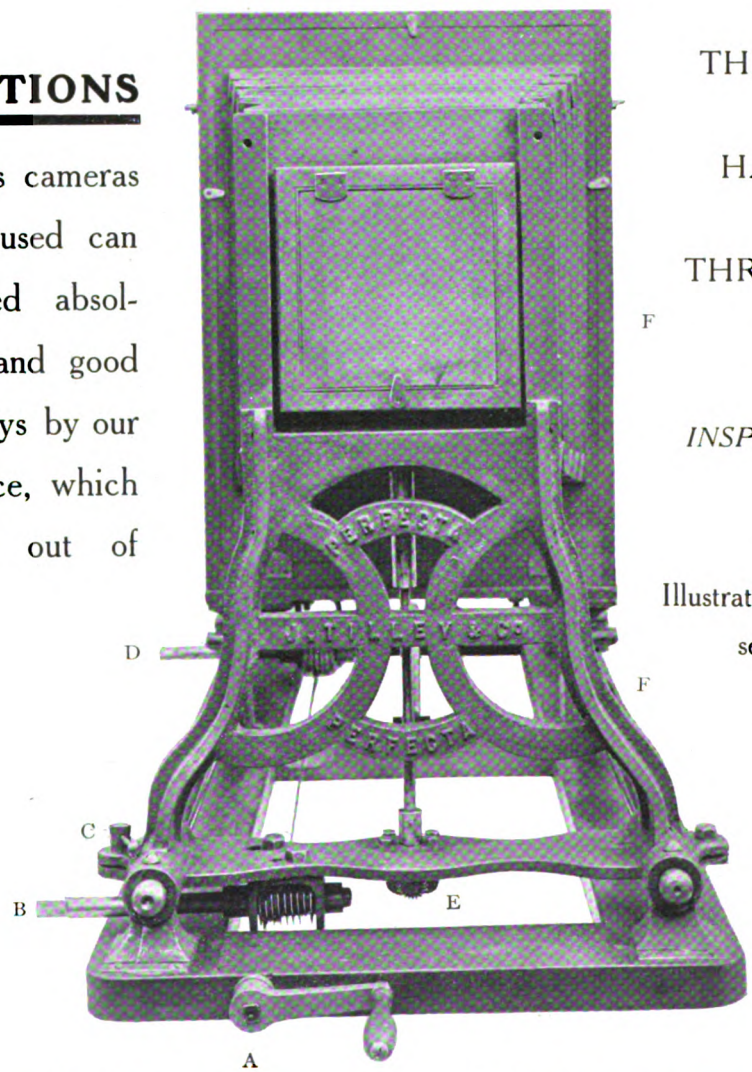

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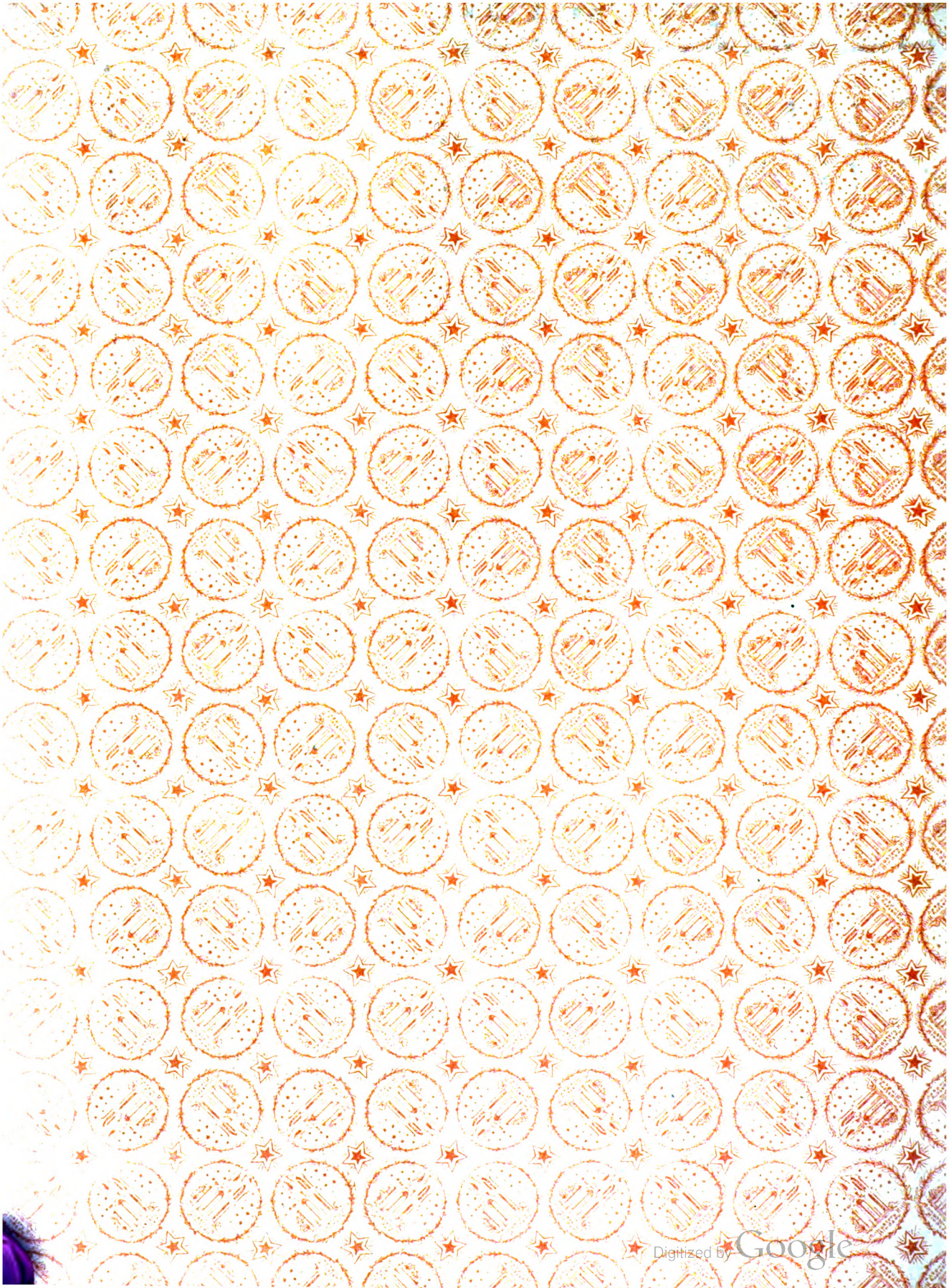
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